

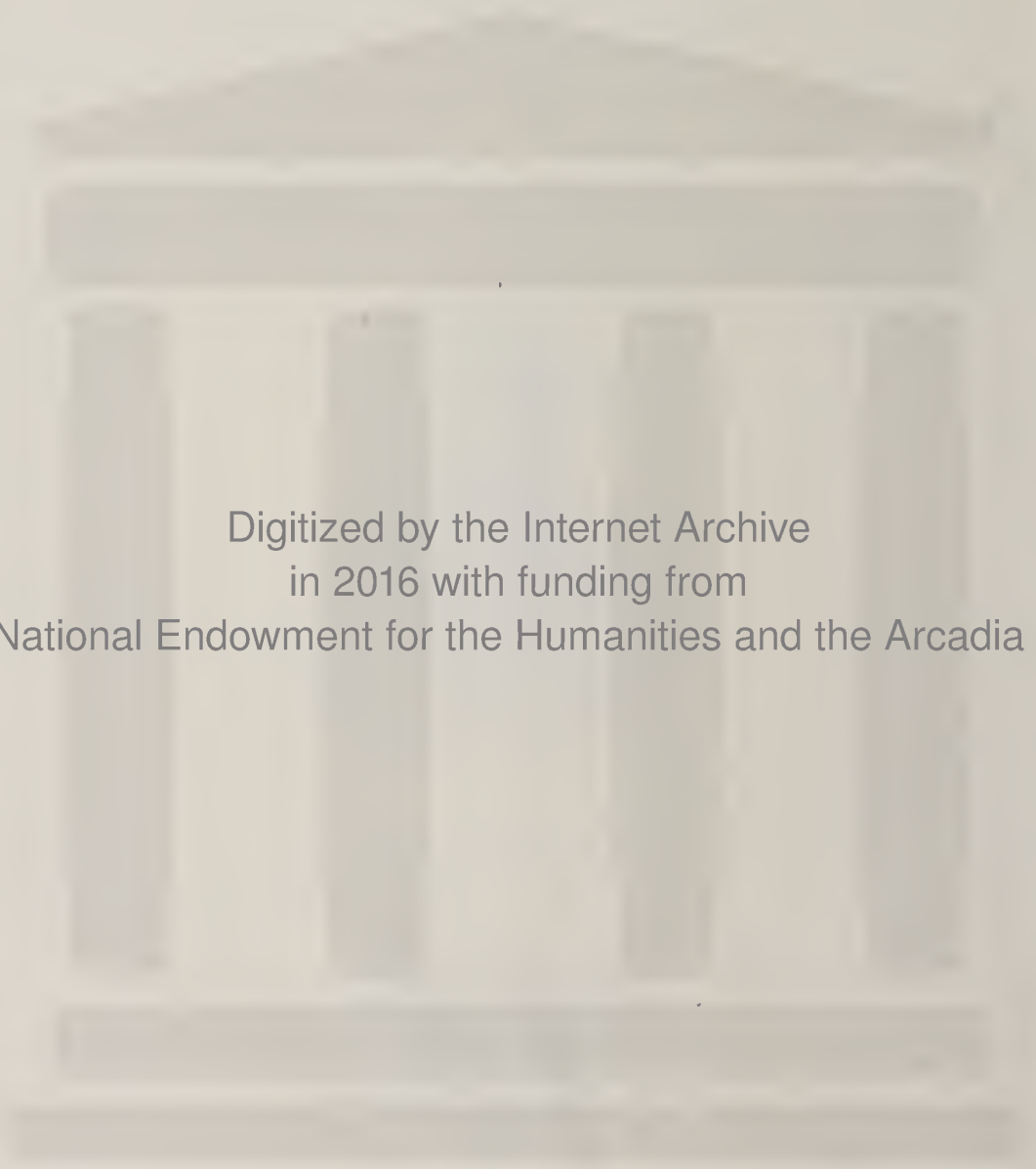
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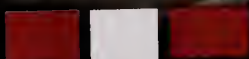


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Minnesota delegation at work at the AMA Interim Meeting, December 5-8, 1982. Picture taken on the floor of the AMA House of Delegates. (from left to right: Robert S. Flom, M.D.; William E. Jacott, M.D.; A. Stuart Hanson, M.D.; John K. Meinert, M.D.; and Richard J. Frey, M.D.)



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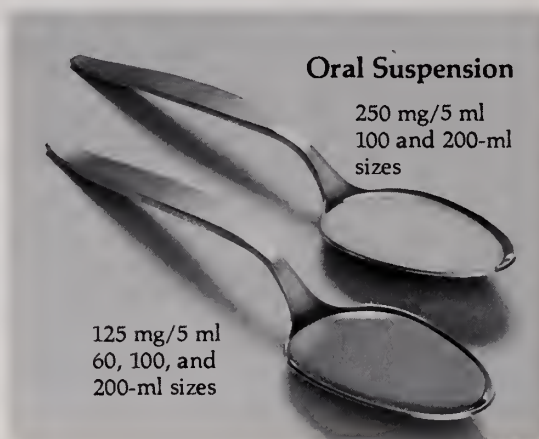
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President's Letter



Medicine and the State Legislature

"Man's capacity for justice makes democracy possible, but man's inclination to injustice makes democracy necessary"

Reinhold Niebuhr,
(U.S. Protestant Theologian)

On January 4, 1983, the 1983-84 biennium of the Minnesota Legislature will convene. It will be structured differently than the last biennium, for we will now have a Democratic Farmer-Labor Governor though the DFL majority remains in the Senate and House of Representatives. All Minnesotans, because of a decrease in revenues, can anticipate higher taxation and a decline in the state services. All Minnesotans will be affected, and our concern is that the reductions in services be equitable.

The members and staff of MMA have been studying priorities on several key issues that will affect the practice of medicine. We are certain to focus strong attention on the following issues:

- Traffic safety including increasing the drinking age, motorcycle helmets and penalties.
- The "Chiropractic Scope of Practices" Bill
- Workers' Compensation — including physician's reimbursement, and quality assurance
- Medicaid and General Assistance programs
- Medical Records, their access, patient ownership, and retention
- Mandatory third party reimbursements for allied health professionals
- Mandatory inclusion of non-physician health practitioners in HMO plans
- The issue of over-supply of physicians from our medical schools.

To better prepare ourselves, two MMA Legislative Workshops were held in Golden Valley and Mankato in late November and early December of 1982. Physicians, their spouses, and legislators attended. Members of the MMA will periodically receive

background information reported in the "Physician's Legislative Bulletin" and MINNESOTA MEDICINE.

How will medicine fare in the upcoming legislature? The answer relates to how effective we have been in our political activity, dating back to the precinct caucuses this past February. Your energetic support of a candidate who won on November 2nd should at least allow a sympathetic ear to your discussions.

However, the main task lies before us, and medicine's impact will be measured by how effectively we communicate with our local legislators. So meet now and continue to meet with your state representatives and senators. Gain rapport and credibility with them and discuss issues of medicine (be they issues of quality medical care or socio-economic issues). Encourage members of your county medical society to do likewise. Support MINNPAC and its enviable record of supporting winning and attentive candidates. Remember, that nearly every profession or trade has its own "PAC", often inimical to the interests of medicine.

We are fortunate to have Robert Reif, M.D. in the House of Representatives for his third term and newly elected A.W. "Bill" Diessner, M.D., in the Senate. The MMA Auxiliary also has a member in the Minnesota House, Gloria Segal (Mrs. Martin A.) of St. Louis Park. These people have been actively involved with organized medicine and know our problems and concerns. As we would want, they are independent thinkers, but it bodes well that people of their background and intelligence are involved in the law making process.

Hardly a year has passed since Jim Sova's ill-timed

PRESIDENT'S LETTER

death. Many of us, members and staff, still feel the shock. But his memory gives us resolve, and staff members such as Chuck Wiger, Kathy Meyerle and Phil Griffin, stand ready to carry on with his high standards. One admonition! Their effectiveness depends on involvement of our MMA membership. With

this commitment your MMA can influence the outcome of legislation, legislation that affects the quality of medical care to all Minnesotans.



Severin H. Koop, M.D.
President
Minnesota Medical Association

Cover Photograph

“Firehole River”

One of the pleasures of skiing at Big Sky in Montana is the chance to spend a day at Yellowstone National Park touring the area by cross-country skis or snowmobile.

Herds of elk and buffalo are seen along the trails; heated water keeps the rivers flowing; and geyser sprays create a frozen landscape.

This elk was grazing on a grassy area adjacent to Old Faithful Geyser. Steam from the upper geyser basin is seen in the distance along the Firehole River.

Dr. Bruce Nydahl, MINNESOTA MEDICINE'S cover editor, and his family were here on vacation several years ago.

Minnesota Dermatological Society Winter Quarterly Meeting Hennepin County Medical Center Friday, 11 February 1983

Current Uses of Lasers

9:00-11:00 Lectures

11:00-11:30 Panel Discussion

Faculty:

Niles Eskritts, M.D. — Stevens Point, WI	(Derm)
John Luckasen M.D. — Omaha, NE	(Derm)
Robert Maisel, M.D. — Minneapolis, MN	(ENT)
Kevin Poitras, M.D. — Minneapolis, MN	(Derm)
Leo B. Twiggs, M.D. — Minneapolis, MN	(GYN)
J. Corwin Vance, M.D. — Minneapolis, MN	(Derm)

11:30-1:00 LUNCH

1:00-2:00 Demonstration of Argon Laser

2:00-3:00 Clinical Case Presentations

3:00-5:00 Discussion of Cases

There will be no fee for the meeting. AAD CME credits will be available — three for the lectures and three for the quarterly clinical meeting.

Contact J. Corwin Vance, M.D., Hennepin County Medical Center.



Editor's Notebook

The Case of the Mechanical Heart Implantation:

One Man's View of Its Human Significance

"Had I been present at the creation I would have given some useful hints for the better ordering of the universe."

Alphonus X. The Learned.

1252-1284. King of Spain

"Creativity implies that leap of imagination and understanding which enables individuals to grow in dignity and purpose in a world where whirl is king."

Arthur Schlesinger, Jr.
Historian.

December 9, 1982 — As an earthling who was present at the creation of the mechanical heart era, I owe it to future generations of physicians to report the first human case and to discuss its relative significance.

Case Report

This 61-year-old, married, retired, white male dentist from Seattle was admitted for artificial heart implantation to the University of Utah Medical Center on Monday, November 29, 1982. In 1977 he retired from his dental practice because of declining health. A Seattle cardiologist diagnosed idiopathic cardiomyopathy. Despite vigorous medical therapy, including steroids to treat a suspected viral myocarditis, his heart condition worsened. This progressed to frank congestive heart failure which confined him to bed.

The Stanford University Medical Center heart transplant team would not consider him for transplant because he was over 50. But through a Stanford physician who was familiar with the Utah mechanical heart implant effort, an interview was arranged with the artificial heart unit team members at the University of Utah Medical Center. The team agreed the dentist — given his attitude, understanding, psychological makeup, and family support — was a good candidate for a mechanical heart. But they advised him they would have to wait for the critical time to replace his heart. That time would be when his own heart could no longer sustain life.

On Monday, November 29, his condition began to dramatically deteriorate. A helicopter ambulance rushed him from Seattle to Salt Lake City. Utah physicians concurred the time was at hand to try their first human heart implant, and he was scheduled for surgery on Thursday morning. The patient and his family consented to the operation. The dentist signed an 11 page explanation and consent form in the presence of the hospital ethics committee. Twenty four hours later, in accordance with Federal Drug Administration regulations, he signed again.

On Wednesday, December 1, his heart showed ectopic ventricular beats and ventricular tachycardia. At one point, an attending cardiologist thumped his chest to get his heart going. Time was running out. Because of the threat of ventricular fibrillation, surgeons decided to operate as soon as possible.

At 10:10 P.M. on Wednesday, hospital personnel wheeled him into the operating room. A surgical team of 30 waited. They inserted tubes into his arteries and veins, gave him Fentanyl, shaved his chest, intubated him, and administered metocurine.

At 11:27 P.M., surgeons incised the skin, divided the sternum, and exposed his huge heart (observers described his heart as "quivering" rather than "beating"). He was placed on cardiopulmonary bypass. At 12:07 A.M., Doctors DeVries and Joyce, the two surgeons,

removed the right and left ventricles. Then they began to attach the artificial polyurethane heart, which was said to look like a "soft, overripe zucchini squash."

At 2:02 A.M., DeVries and Joyce finished attaching the mechanical heart. At 2:20 A.M., they tried to start it. But the artificial left ventricle didn't function properly. So they opened it — three times — to adjust its angle. At 4:09 A.M., they had it working right. They closed the chest at 6:35 A.M. Nearly three hours later, at 9:30 A.M., the patient opened his eyes. When commanded, he could move his hands and feet, indicating he had no overt brain damage.

For the first few days after surgery, the patient did well, i.e., he was alert, undergoing diuresis of excess fluid, and had the pink color of a person whose tissues were well oxygenated. But on December 5, he required surgery to close an emphysematous bleb that was causing subcutaneous emphysema. On December 7, he had a prolonged seizure. Negative electroencephalogram and a CAT scan made cerebral hemorrhage or embolism unlikely, so his seizures were attributed to either metabolic imbalance or to Ancef, a cephalosporin type of antibiotic. At this writing the patient is still on the critical list.

Significance

What is the significance of this remarkable surgical feat? No one can say for sure. Some, no doubt, will extol it a technological achievement of the highest order, American Medicine's equivalent of a moon shot. Others will praise the combined efforts of the technological team and the virtues of its multidisciplinary approach. Still others will wax on the moral considerations. And why not? After all, there are an estimated 50,000 candidates for mechanical hearts, and at \$250,000 a case, who is going to choose who gets one and who is going to pay the bill? And, finally, there are those who will argue the true significance lies in the futuristic implications (Once you have replaced a human heart with a machine, can brain replacement with a computer be far behind?)

On another level, a few aesthetic souls will be upset because the implant threatens to destroy the ancient myth that the heart is the seat of all emotions. Thus far the present implant recipient acts calm, grateful, and optimistic. He has yet, to my knowledge, shown any signs of mechanical thought failure. Whatever the implant does, I hope its success makes heart transplants obsolete. Maybe then heart transplant jokes will stop. To wit: when asked whose heart he wanted most, a hypothetical transplant recipient is said to have responded: "I want the heart of an IRS agent because I want a heart that has never been used."

But as for me, I believe the significance of this mechanical heart implantation is not technological, multidisciplinary, moral, futuristic, or esthetic. I view it simply as a triumph of persistent human creativity bucking the odds.

Consider the background of the two inventive physicians whose ideas made the mechanical heart possible.

- William Kolff, now 71 and Director of the Institute for Biological Engineering at the University of Utah, developed the first artificial kidney as a young physician in Nazi-occupied Netherlands. After seeing one of his patients die of renal disease in 1939, he seized upon the idea of a machine to filter out urea and other toxic products from the patient's blood. In the early 1940s, using his own money and the donated services of a Dutch industrialist, he constructed the first artificial kidney out of sausage — cellophane, beer cans, and window screening material.

Using this crude dialysis device, he treated 16 patients the next few years. All died, but in 1945, on his 17th try, he saved the life of a 67-year-old woman.

In 1950, Kolff left the Netherlands to head up an artificial heart project at the Cleveland Clinic. From there, he went to the University of Utah in 1967, to become director of an artificial organ program.

In the early 1970s, the federal government, which up until then had invested almost \$100 million developing an artificial heart, began to get edgy about its investment.

This edginess increased when the idea of a plutonium powered nuclear heart failed. NIH shifted its priorities to develop a left ventricular assist device (LVAD). Kolff disagreed, insisting an artificial heart with a left and right ventricle was preferable. He carried on, and placed his bets on the shoulders of a young protégé, Robert Jarvik, who was not to graduate from medical school until 1976.

- At 36, Robert Jarvik is a famous young man — the inventor of Jarvik-7, the polyurethane heart now beating within the body of the dentist. But his life has hardly been one of uninterrupted success by traditional medical standards.

It started well enough. At 17, after watching his physician father operate, he designed a surgical stapler to close skin incisions. But he wasn't sure what he wanted to be and harbored an ambition to be an artist.

At Syracuse University from 1964 to 1968, he studied architecture and mechanical drawing and won a degree in zoology. But his grades weren't good enough to qualify him for an American medical school. So he attended a medical school in Bologna, Italy. He dropped out after two years and returned to the New York University, from which he received a degree in 1971 in occupational biomechanics.

That year he caught the eye of a surgical suture manufacturer, who was so impressed with the young man's potential that he called Kolff.

Kolff gave him a grant to attend the institute for artificial organs for a year. Jarvik designed his first heart in 1972, trying it on sheep and calves. His design went through five major changes. One of his later versions kept a calf named Alfred Lord Tennyson alive for 268 days. Meanwhile, he re-entered medical school at the University of Utah, receiving his M.D. in 1976. Of her husband, his wife of 14 years says: 'He is a person who is always able to find a parking place. He is an opportunist. He make things work.'

The Tale of Two Men

The stories of these two men, the 71-year-old dean of artificial organ work and his 36-year-old protégé, reveal a great deal about creativity and creative people.

1. Creativity is not limited to the arts; it occurs in all fields of endeavor and is often characterized by a variety of seemingly unrelated experiences. Creative individuals come from all sorts of backgrounds from all parts of the world. They function best, however, in environments that are open to opportunities. In Medicine, it is not happenstance that the world's leading heart transplant program is in California (led by a Minnesotan), that the largest renal and liver transplant program is in Minnesota (led by a Californian), and that the most innovative artificial organ program is in Utah (led by a displaced Dutchman).

2. Creative people vary in age, but they make their mark when they are young. Aging does not lessen their creativity. They share other things in common: they introduce new concepts to old ways of doing things; they are willing to risk everything to show their ideas will work; and in the end, they may change the very structure of the field in which they operate.

3. Creative people are concerned with the theoretical and the esthetic, rather than the practical and the political. This does not mean they are wild-eyed idealists; it means they see what others do not see. Nonetheless, because they have their own vision, they tend to be loners who make their own way, outside the conventional career paths followed by most.

4. Creative minds tend to tackle the toughest problems under adverse conditions. Indeed they often do their best work under the most dismal circumstances. Keep in mind that Kolff and other European victims of Nazism such as Einstein, Fermi, and Leo Szilard, did their most brilliant work in the darkest times.

5. Creativity is a genetic trait. It bubbles up from within, and it cannot be suppressed. Nor can it be measured, taught, or defined. The creative person does not always play by the usual rules, standards, or expectations of society. Creativity has little relationship to formal

education. Furthermore, the creative person may show little concern for bread and butter problems, internal and external regulations, and the demands of bureaucracy of large and comprehensive institutions. For these and other reasons, the creative individual may be considered a troublemaker, a misfit, or a nonperformer.

6. Creativity is the working of an active mind seeking connections between the conscious and the subconscious. The creative mind spontaneously does a lot of backing and filling between these parts of the mind until by some sudden insight, the right answer snaps into place. A mentor or other members of a team can stimulate creativity, but they cannot delegate nor schedule it.

7. Creative minds deal with broad gauge problems of real scope and significance, rarely worrying about the specific reasons a problem cannot be solved. "Messy" problems, i.e., real world problems that cannot be quantitated, controlled, nor cornered — fascinate them and do not inhibit them.

8. Creative people are inventive. They relish in unconventional solutions. Their minds somehow sort through all the "wrong" solutions to find the "right" answer. They often do this on their own, without the requisite academic credentials and without a research staff of their own. They cross the imaginary lines between disciplines. Jarvik's mechanical heart required the mind that understood materials, flow dynamics, and physiology. Here writer Arthur Koestler explains this creative process:

"Creativity in science can be described as the art of putting two and two together to make five. In other words, it consists of combining previously unrelated mental structure in such a way that you can get more out of the emergent whole than you put into it. This apparent bit of magic derives from the fact that the whole is not merely the sum of its parts, but the expression of the relationships between parts."

9. Creativity is an act of faith for the one with the creative idea. He *knows* it will *work*. What makes certain creative people effective is they concentrate on the future rather than the past, on opportunities rather than problems, on their own ideas rather than those of others, and on the *big bold* idea rather than what is *safe* and *easy to do*.

10. Lastly, the creative individual not only *conceives* but *persists*. The greatest asset of such a person is determination to see his idea through. Calvin Coolidge said it this way:

"Nothing in the world can take the place of perseverance. Talent will not: nothing is more common than men with talent. Genius will not: unrewarded genius is almost a proverb. Education will not: the world is full of educated derelicts. Perseverance and determination alone are omnipotent. The proverb "press on" has solved and always will solve the problems of the human race."

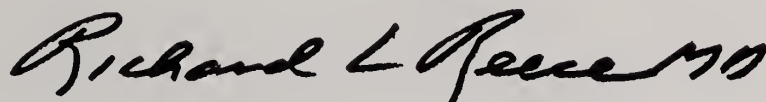
Summary

A 61-year-old Seattle dentist suffered for five years from heart failure secondary to idiopathic cardiomyopathy. He underwent a 7½ hour heart operation on December 1 and 2, 1982, during which his two ventricles were replaced by a Jarvik-7, a polyurethane mechanical heart powered by compressed air. Post-operatively, he had subcutaneous emphysema from a ruptured emphysematous bleb and from seizures secondary to either metabolic imbalance or to Ancef, a cephalosporin type of antibiotic. At this writing, eight days after surgery, he is still on the critical list. I believe the first mechanical heart transplant represents a triumph of persistent creativity on the part of Doctor William Kolff and Doctor Robert Jarvik, both of whom believed so strongly in the idea of an artificial heart that they made it work in the face of odds against them and their concept.

Addendum: In putting together this case report and essay, I have borrowed and modified information and ideas from these sources: the *New York Times* newspaper accounts of the

EDITOR'S NOTEBOOK

mechanical heart transplant, the November 28 *New York Times Magazine* article "Spare-Parts Surgery," an October 1982 *Harvard Business School Bulletin* article "Two Inventions," Arthur Koestler's book *Janus* (Random House 1978), and Peter Drucker's book *The Effective Executive* (Harper & Row 1967).



1983 MMA Annual Meeting

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Highlights of the Month

Scientific Program

The 1983 Scientific Program will open May 19, 1983 with "Decision Making Coronary Artery Disease — 1983" as a one-hour plenary session moderated by John A. Spittell, Jr., M.D., Rochester, and followed by an optional two-hour discussion session. Other morning breakout sessions are: "Everyday Ethics" led by Alvin Schultz, M.D., Minneapolis, and "Rheumatology" presented by Roger Colton, M.D., St. Paul, Chairman of the MMA Resource Group on Rheumatic Diseases. The topic "Biotechnological Medicine and Clinical Implications" will be addressed by John Morley, M.D., Minneapolis, and David Brown, M.D., Minneapolis. Doctors Morley and Brown will speak on "Neuropeptides" and "Recombinant DNA Technology" respectively.

House of Delegates

In response to a 1982 House of Delegates' action, the 1983 House of Delegates will meet on two consecutive days, Wednesday, May 18 and Thursday, May 19. A "Reference Committee Orientation" breakfast meeting is planned to precede the first session of the House and will serve in lieu of a delegates' orientation session.

Future Announcements in MINNESOTA MEDICINE and the MMA MONITOR to Include More Highlights of the 1983 Annual Meeting.

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Hypoglycemia Due to Insulinoma

An Unusual Cause of Altered Mental Status in a Young Man

ROBERT D. POWERS, M.D.*† and JOHN F. ROBB, M.D.*

An acutely confused and disoriented young man was brought by friends to a city hospital emergency room. It was felt initially that his condition was compatible with toxic encephalopathy, but a systematic evaluation disclosed hypoglycemia secondary to an occult insulinoma. The wide spectrum of clinical presentations of hypoglycemia is discussed, along with recommendations for rapid evaluation and therapy when this condition is suspected.

EVALUATION OF THE confused or disoriented patient is one of the common challenges of medical practice. It is often difficult to obtain an adequate history, and physical findings that suggest a specific organic cause are rarely present. While toxic encephalopathy or functional/behavioral illness is often the correct diagnosis, the occurrence of treatable metabolic and organic etiologies of altered states of consciousness mandates a systematic approach to all such patients. The following case of hypoglycemia due to an insulinoma highlights this principle, and reaffirms the role of the primary physician in rapid diagnosis and management of this complex medical problem.

Case Report

A 24-year-old man was brought to the emergency room in the early evening because of unusual behavior. His roommates stated that he had failed to awaken at his customary time that morning and when they had gone to check on him later in the day, they had difficulty arousing him. His friends and relatives were unsure of any alcohol or drug use in the previous twenty-four hours, and there was no history to suggest toxin exposure. The patient had been in excellent health, although careful questioning of his brother indicated that the patient had had a few instances over the past several months where he complained of a sense of unreality and experienced twitching of his hands.

On arrival in the emergency room, the patient was drowsy, but easily arousable. Blood pressure was 140/72 mm Hg., the pulse was 68/min., he was afebrile. General physical exam was within normal limits, a neurologic exam showed intermittent weakness of the left side. His speech was slurred and slow,

he was oriented to place and year but not to month, day, or time. His remote memory was intact, but he had no recollection of recent events.

Blood and urine were obtained for toxic screens and measurement of serum electrolytes. The patient was given 50 cc of 50% dextrose solution intravenously, and his mind cleared, although he remained drowsy. Consultation with a neurologist was obtained. She agreed he was lethargic but found no consistent focal changes. Arrangements were made for a CT scan of the head prior to thorough neurologic evaluation including EEG and lumbar puncture. At that time his blood glucose, drawn prior to the administration of the 50% dextrose, was reported as 23 mg/dl. A 5% dextrose infusion was begun, the scheduled neurologic evaluation postponed, and the patient was admitted to the medical service for evaluation.

The admission physical examination was unremarkable. Repeat neurologic examination disclosed only mild lethargy. Shortly thereafter, the patient was alert and oriented, and remained so throughout his hospitalization. A blood glucose drawn after dextrose administration was 150 mg/dl. Serum calcium, electrolytes, BUN, creatinine, and hepatic enzyme levels were all within normal limits. Screening of urine and serum for drugs and toxins disclosed no abnormalities.

His inpatient evaluation began with a fast under careful observation, during which insulin and glucose levels were measured at four hour intervals. After an 18 hour fast, his blood glucose had dropped to 18 mg/dl, at which time his insulin level was determined to be 20 microcuries/ml. Morning and afternoon cortisol levels were within normal limits. It was felt that these results were diagnostic of insulinoma, and attention was focused on the pancreas. A CT scan of the abdomen was totally normal, but selective celiac

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angiography revealed a lesion suggestive of vascular adenoma within the body of the pancreas. Surgical consultation was obtained, and the patient underwent laparotomy with successful removal of a 1 cm benign insulinoma. After a bout of mild post-operative pancreatitis, he recovered uneventfully and was discharged.

Discussion

Insulin secreting tumors of the pancreas are rare neoplasms, but must be considered in all cases of hypoglycemia. They occur most frequently in patients over 40 years of age, and the majority have had symptoms for several months before the diagnosis is established. Pathologically, most are solitary benign adenomas amenable to surgery, although microadenomatosis and islet cell carcinomas can be a source of insulin excess and produce an identical clinical picture.¹

Documented hypoglycemia (blood sugar less than 50 mg/dl) has numerous other etiologies (Table 1), ranging from common to obscure. The clinical manifestations usually are not evident until the blood glucose is less than 45 mg/dl, and some of the "classic" symptoms and signs of adrenergic overdrive (Table 2) are dependent on a rapid rate of fall. This accounts for the familiar clinical picture caused by

excess exogenous insulin administration. These comatose, sweating patients are rarely misdiagnosed; but the variable presentation of patients with hypoglycemia of other etiologies can be a source of diagnostic confusion and potentially harmful delays before proper therapy is initiated.

The difficulty in correctly diagnosing this condition is compounded by its resemblance to other, perhaps more common disorders. Neuroglucopenia can cause a wide spectrum of central nervous system disturbances, ranging from non-specific symptoms such as diplopia, amnesia, incoordination, or inappropriate affect; to clearly focal deficits such as anisocoria, hemiparesis, or isolated aphasia. These may progress to seizures or coma, or remain as fixed deficits for several hours.² Unfortunately, these findings also suggest several

TABLE 2*
Symptoms and signs of hypoglycemia.

Adult	
Adrenergic	Neuroglucopenia
Tremulousness	Headaches
Anxiety	Weakness
Hunger	Diplopia
Sweating	Confusion
Palpitations	Amnesia
Tachycardia	Incoordination
	Seizures
	Coma

TABLE 1*
Causes of fasting hypoglycemia.

- A. Organic hypoglycemia: recognizable anatomic lesion:
 1. Pancreatic islet beta-cell disease with hyperinsulinism in the adult:
 - (a) Adenoma, single or multiple
 - (b) Microadenomatosis, with or without macroscopic adenoma
 - (c) Carcinoma, with metastases
 - (d) Adenoma(s), microadenomatosis or carcinoma, associated with adenomas or hyperplasia of other endocrine glands (MEA)
 - (e) Hyperplasia (very rare in adults)
 - In infancy and childhood:
 - (a) Hyperplasia (leucine-sensitive or — insensitive)
 - (b) Nesidioblastosis
 - (c) Adenoma
 2. Nonpancreatic tumors associated with hypoglycemia
 3. Anterior pituitary hypofunction
 4. Adrenocortical hypofunction
 5. Acquired diffuse hepatic disease
 6. Severe congestive heart failure
 7. Severe renal insufficiency in non-insulin-dependent diabetics
- B. Hypoglycemia due to specific hepatic enzyme deficiency (infant and childhood)
- C. Functional hypoglycemia: no recognizable or persistent anatomic lesion:
 1. Deficiency of glucagon
 2. Severe inanition
 3. Ketotic hypoglycemia (childhood)
 4. "Insulin autoimmune syndrome" and hyperinsulinemia
- D. Hypoglycemia induced by exogenous agents:
 1. Ethanol (and poor nutrition)
 2. Insulin administration
 3. Sulfonylurea administration
 4. Ingestion of ackee fruit (hypoglycin)
 5. Miscellaneous drugs

other disease entities, and there is a large margin for error in diagnosis when presented with a patient manifesting one or more of them. In the young man whose case is presented above, it was initially felt by the examining physician that his symptoms could be accounted for by ingestion of an illicit substance. Fortunately, routine serum chemistry determinations were ordered as well as a screen for toxic substances, and an ampoule of 50% dextrose was administered before these results became available. Even the most competent clinician may mistake hypoglycemia for mental illness, hypoxia, or intoxication. The assumption that the altered mental status of an inebriated person is due solely to alcohol is dangerous, and should be arrived at only after exclusion of other metabolic, traumatic or infectious causes. Alcoholics are prone to hypoglycemia, particularly after binge drinking sprees where caloric intake has been minimal.

Although hypoglycemia as a paraneoplastic syndrome is uncommon, it must be considered in all cases of disturbance of mental function in a patient with a malignancy. Too often the patient with cancer and an acute problem is assumed to suffer from progression of his or her disease rather than a treatable complication. Thus, the cancer patient with confusion or fixed focal deficits is often evaluated less rapidly and thoroughly than otherwise healthy persons, and the occasional case of hypoglycemia may go untreated until permanent damage results.

Perhaps the most dangerous assumption to make in the assessment of an acutely ill patient is that a focal

neurologic deficit is the result of a structural rather than a metabolic lesion. The focal manifestations of neuroglucopenia can easily mimic those of a cerebrovascular accident, and must be kept in mind when evaluating a so called "stroke patient". The elderly are susceptible to hypoglycemia because of medication confusion and erratic dietary habits. Potential tragedy in an elderly patient presenting with a fixed neurologic deficit from hypoglycemia can be easily avoided by measurement of serum glucose and administration of 50% dextrose. This should be done before calling for a neurologic consultation or a CT scan.

Once the diagnosis of hypoglycemia is made, a search for the cause should begin immediately. In the obvious case of a diabetic who has taken too much insulin, the etiology and treatment are readily apparent. Any other person with documented hypoglycemia may need an extensive evaluation requiring sophisticated tests. Such patients should be referred to the appropriate specialist for inpatient evaluation.

While most practitioners are already accustomed to drawing blood for glucose determinations and administering 50% dextrose in comatose or convulsing patients, a case can be made to widen the indications for these procedures to include any confused patients or those with new neurologic deficits. The potential benefits to the patient far exceed any risk.

Acknowledgment

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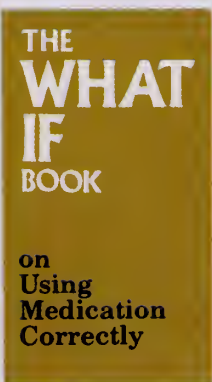
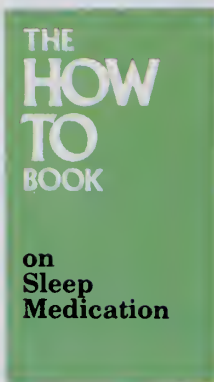
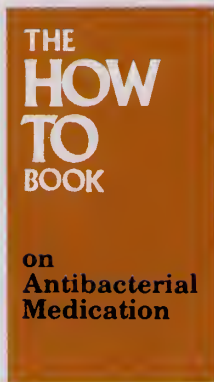
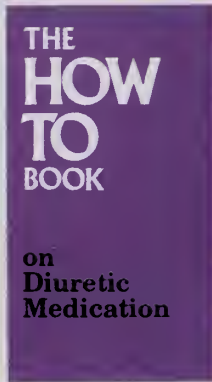
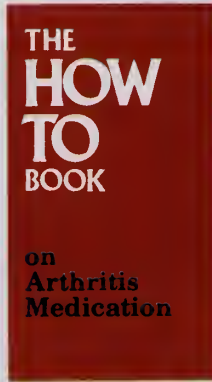
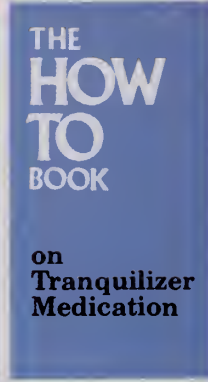
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Diagnosis and Treatment of Thoracic Outlet Syndrome†

WILLIAM T. SIMONET, M.D.;‡ PAUL G. GANNON, M.D.;* EVAN F. LINDBERG, M.D.;*
and JOHN R. SATTERFIELD, JR., M.D.*

The various syndromes now known as thoracic outlet syndrome, and the history of its surgical treatment are reviewed. We report our series of 30 surgically treated cases, and discuss the diagnosis and current management of this condition.

THORACIC OUTLET syndrome is a collective term first introduced by Peet and associates in 1956 to describe the symptom complex of neural, arterial, and venous disorders of the upper extremity caused by compression of these neurovascular structures.⁹ Conditions which fall under this collective term include: scalenus anticus, costoclavicular compression, cervical rib, hyperabduction, Paget-Schroetter, shoulder-arm, and subcoracoid-pectoralis minor syndrome among others. Patients with this syndrome are likely to present to a variety of physician specialties, from Family Practitioners and Internists, to Neurologists, Orthopedists, and Thoracic Surgeons. The symptom complex may be incorrectly attributed to angina pectoris, osteoarthritis, Raynaud's phenomenon, or functional conditions. This variability of patient presentation, the lack of sensitive and specific diagnosis tests, and the ambiguity of ideas commonly held concerning etiology and treatment, make thoracic outlet syndrome a confounding problem for most physicians.

The purpose of this paper is to briefly review the history of this condition and to present a typical case. We review our series of 30 surgically treated cases and compare our results to those reported by others. We conclude with a discussion of the evaluation, and treatment of patients with this syndrome.

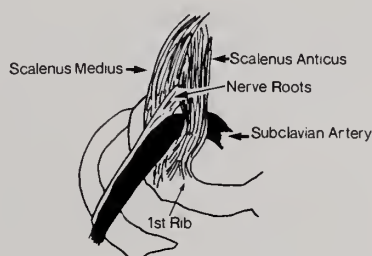
Historical Review

The recognition of cervical ribs dates back to the early anatomists Galen and Vesalius. Diagnosis of a syndrome created by these ribs was first recorded by Willshire in 1860.¹⁸ Murphy in 1905 first advocated the idea that compression of the neurovascular bundle between a cervical rib and the scalene muscles could produce symptoms. He resected the cervical rib after it had produced an aneurysm of the subclavian artery.⁶

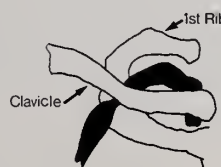
Stopford and Telford in 1919 first presented evidence that the brachial plexus and subclavian artery could be compressed by other structures in patients without cervical ribs.¹⁴ Also at this time Adson introduced the diagnostic maneuver which bears his name, and is still used today.¹ The Adson test involves checking for a decrease in radial pulse when the head is turned sharply towards and away from the suspected thoracic outlet. Thinking at this time was that "adventitious lig-

Diagram: Anatomy of Thoracic Outlet Syndrome

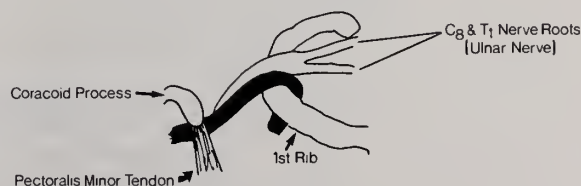
Costoscalenic Hiatus



Costoclavicular Passage



Superior Thoracic Outlet



Figure

*Thoracic surgeons, Minneapolis.

†This is the anatomist's thoracic inlet which is called outlet by surgeons since the artery and brachial plexus exit here. The new term is now superior thoracic aperture.

‡Presently Resident, Mayo Clinic, Rochester.

aments'' of the scalenus anticus muscle were responsible for neurovascular compression. The almost uniform treatment of the time was scalenotomy.

Falconer in 1943 introduced a new concept: The possibility of neurovascular compression between the clavicle and first rib without abnormality of scalene musculature.⁴ Thus the term costoclavicular compression entered the literature. Also introduced about this time was what was thought to be a variant of the previously described conditions which was caused by hyperabduction of the arm. This was known as hyperabduction or subcoracoid pectoralis minor syndrome.

Owing to the confusion in diagnosing these syndromes, there was also considerable confusion regarding the proper surgical treatment. Lord suggested claviclectomy for costoclavicular compression, and pectoralis minor tenotomy for treatment of subcoracoid pectoralis minor syndrome.⁵ By the early 1950s several large series reported less than 50% good result with scalenotomy, and surgeons began to look for alternative modes of treatment. In 1956 Peet observed that as the symptom pattern for all of these conditions was similar, so was the etiology.⁹ He suggested that compression against the first rib was the common pathology, and introduced the term thoracic outlet syndrome for all shoulder area neurovascular compression syndromes of the upper extremity.

The presidential address in 1962 by Clagett before the American Association for Thoracic Surgery cited the 60% failure rate of scalenotomy, and suggested treatment by first rib resection.³ This was followed by Roos in 1966 presenting the technique of transaxillary approach to first rib resection. He reported 93% success in relieving the patient's symptoms.¹² Urschel confirmed this degree of success by reporting his series of 84% success with first rib resection compared to 23% with scalenotomy.¹⁶ Thus the modern surgical treatment of choice for thoracic outlet syndrome, first rib resection via transaxillary approach, has only been in common use for less than 15 years.

Case Report

A 27-year-old white female experienced coolness in her right hand, numbness and tingling in her fingers, and shooting pains down the ulnar side of her arm to her little finger. Her symptoms had begun very gradually for many months, perhaps even years prior to consultation, could not be traced to any illness or injury to the arm or neck, and had gradually gotten slightly worse. She noted that the symptoms could be brought on by raising her arm above her head, or by carrying anything such as a purse on her arm. Her symptoms were somewhat relieved by abducting the arm slightly and flexing the elbow. She initially sought chiropractic help, and underwent several treatments with no relief. She then saw her family physician. He obtained chest and cervical spine Xrays which were normal. Based on history despite the normal Xray report, he suspected neurovascular compression in the shoulder region and sought the consultation of a neurologist. The neurologist thought that she indeed had symptoms of nerve compression primarily in the ulnar distribution, and ordered an ulnar nerve conduction velocity (UNCV) test. This showed conduction through the thoracic outlet of 60 m/sec (normal: 72 m/sec). Consultation of a thoracic surgeon was then obtained.

Physical examination revealed the young woman to have weak shoulder musculature and poor posture. A bruit was heard over the subclavian artery when the arm was hyperabducted; however, not in other positions. Her right hand was somewhat cooler, but was normal in color. She was also noted to have a positive Adson test. A diagnosis of thoracic outlet syndrome was made. After an unsuccessful trial of physiotherapy, surgery was offered. The patient underwent transaxillary resection of the first rib. Anatomic findings at surgery were entirely within normal limits. The patient subsequently continued to have paresthesias in the ulnar distribution, but these gradually subsided by three months post-op. She experienced immediate and complete relief of the coolness in her hand, her subclavian bruit was gone and her Adson test returned to normal. She has now returned to full activity and has been completely free of symptoms for ten years.

This case was selected because it illustrates well several findings which are common to most thoracic outlet syndrome patients. The presentation is somewhat typical: gradual onset of symptoms which began usually months before the patient seeks help. The coolness in the hand in certain arm positions is typical of vascular compression, and is suggested by the findings of a positive Adson test, and the positionally related subclavian bruit. The paresthesias and shooting pains in the ulnar distribution are also very typical. Whether these subjective symptoms are confirmed by the slowing of the UNCV test is debatable. The normal chest and C-spine Xrays are not unusual. The poor posture and weak shoulder musculature is a common, but not universal finding.

Results of Surgical Treatment

Our experience includes 30 rib resections in 29 patients from 1969 through 1979. All were done via the transaxillary approach. The average patient age was

TABLE 1

Data from Review Cases

Women	20 Cases 74%
Men	7 Cases 26%
Age Range: 17 yrs. to 50 yrs.	Average 33.6 yrs.
Findings: Cervical — Ribs	5 18.5%
Tests: Adson or hyperabduction	Positive in 12 of 18 = 66.7%
Myelogram	Negative in all six done
EMG	Positive in 3 of 10 = 30%
Complications: Transient paresthesias involving various nerves (None were debilitating)	13 = 48%
Intraoperative pneumo	4 = 15%
Wound infection	1 = 4%
Vascular injury	1 = 4%
Injury to long thoracic nerve	1 = 4%

33.6 years, and 74% were female. (Table 1). All presented with arm pain of some type. Most had one or more of the following physical findings: Positive Adson test, paresthesias in a specific nerve distribution (usually ulnar), or temperature differential between the two hands. Ten patients underwent UNCV tests, three of which were reported positive. Six patients underwent cervical myelograms to rule out root pathology, all of which were negative. Five patients had cervical ribs at surgery, all of these were discovered on routine pre-op Xray examination.

Three patients of our 30 were lost to follow-up leaving 27 cases of first rib resection in 26 patients for review. We used Urschel's criteria to assess our results.¹⁶ A good result meant complete relief of symptoms; fair result, improvement with some residual; and poor result meant no improvement. Our results were 78% good, 18.5% fair, 3.5% poor (Table 2). Our follow-up ranged from 2 months to 11 years with a mean of 6.2 years.

The largest recent series on thoracic outlet was reported by Roos.¹³ He reviewed a series of 566 patients diagnosed as having thoracic outlet syndrome. Two hundred thirty two (41%) patients eventually required surgery after failure of conservative treatment. He reported good to excellent results in 88.8% of his surgical cases, with fair to poor results in the remaining 11.2%. No patient in this series was made worse. He encountered cervical ribs in 9.2% of his patients.

Urschel reported his series of 128 cases treated surgically, 83% of this group had complete relief of symptoms, and another 12% reported some improvement.¹⁶ Seventeen percent of these patients had cervical ribs.

Discussion

Anatomy

As was pointed out by Clagett, in reviewing the anatomic aspects of the region traversed by the axillary vessels and brachial plexus, it is not surprising that symptoms of compression occur, it is only surprising that they do not occur more frequently.³ The path of the neurovascular structures through the thoracocervicoaxillary region is best understood in terms of

etiology of thoracic outlet syndrome when it is divided into three passage narrowings: the superior thoracic outlet, the costoscalene hiatus, and the costoclavicular passage. A brief review of the anatomic contents of these passages, and their orientation during various movement of the upper extremity will further the understanding of the etiology of the syndrome and proper treatment (see Figure).

Superior Thoracic Outlet

This passage is entirely limited by osseous structures. The first rib laterally, the spine posteriorly and the manubrium of the sternum anteriorly form a frame for the neurovascular structures which loop over the first rib en route to the arm. Conditions which may affect this space include lesions of the thyroid gland, the pleura, or adenopathies of various etiology. Cervical ribs with an estimated incidence of 0.5 to 1.0% in the normal population also encroach upon this space if present. The neurovascular structures may be compressed against the first rib by space occupying lesions as described, or by traction on the vessels causing tenting of the neurovascular structures around the coracoid process and its insertion of the pectoralis minor indirectly causing traction.

Costoscalenic Hiatus

The normal anatomic arrangement finds the brachial plexus and subclavian artery passing through a triangular space bound anteriorly by the scalenus anticus, posteriorly by the scalenus medius muscle, and inferiorly by the first rib. The subclavian vein usually passes anterior to the scalenus anticus muscle. This arrangement is subject to many variations. The scalene muscles can have varying fibrous or fibromuscular bands which were originally blamed for causing thoracic outlet compression. The insertions of the scalene muscles on the first rib may also vary and may overlap. This creates a vise-like situation upon the neurovascular structures during muscle contraction and is the situation tested for by the previously described Adson maneuver.

Costoclavicular Passage

This is also a triangular space confined by the clavicle and subclavian muscle posteriorly, and the

TABLE 2

Surgically Treated Thoracic Outlet Syndrome

Number of Patients	29
Number of Operations (One patient bilateral)	30
Number of Cases Lost to Follow-up	3 (10%)
Number of Cases Available for Review	27
Results: Good (Complete relief of sx)	21 (78%)
Fair (Improved with some residual)	5 (18.5)
Poor (Not improved)	1 (4%)

anterolateral border of the first rib medially. This passage is subject to the most change in size and shape during movement of the upper extremity. The clavicle through its articulation at the sternoclavicular joint is relatively mobile and can be brought into close approximation with the first rib during depression and adduction of the scapula — the so-called military brace or costoclavicular maneuver. Malunion of clavicular fracture can also result in loss of normal space.

The common border of each of these passages is the first thoracic rib. While distinguishing between the various sites of neurovascular compression may be difficult, it is now thought to be unnecessary. Once the diagnosis of thoracic outlet syndrome is made, treatment involving physiotherapy and/or surgery for resection of the first rib is the same regardless of which passage or combinations of passages is causing the compression.

Signs and Symptoms

The symptomatology of thoracic outlet syndrome is variable depending upon whether nerves or vascular structures, or both are compressed, and where they are compressed. Pain and paresthesias are present in 95% of cases, 90% of these show at least some involvement of the ulnar nerve distribution.¹⁵ These symptoms may seem to be radicular in distribution as well as localized to specific nerves and therefore may be difficult to distinguish from cervical root pathology. The pain may also radiate to the chest wall and as such may be mistaken for angina.¹⁷ A carefully taken history may reveal that the symptoms may be elicited by drooping of the shoulders or certain positions of the arm. This is very important in narrowing the differential diagnosis.

Symptoms specific to vascular compression are present in about 40% of patients.¹⁵ Usually these symptoms result from arterial compression and involve coldness and blanching of the fingers. Often these patients may carry a diagnosis of Raynaud's phenomenon; however, careful distinction should be made as to

whether the cause is temperature change as in Raynaud's, or activity as in thoracic outlet syndrome. Venous symptoms may vary from the classic effort thrombosis of Paget-Schroetter, to edema, venous distention, or discoloration.

Objective physical signs are more often based on vascular compression than neural. A position related loss of radial pulse as in the Adson maneuver, hyperabduction, or hyperextension is present in about 80% of cases.⁸ Venous distention and edema, temperature changes, and trophic skin changes are rare, (< 10%) but good evidence for thoracic outlet syndrome if present. Signs persistent of neural compression such as sensory abnormalities or motor weakness are also rare, occurring in only 10-15% of cases. Bony abnormalities such as cervical rib, bifid first rib, or fusion of first and second ribs are present in about 20%.

Diagnostic Tests

The rather subjective nature of the previously mentioned signs and symptoms makes the need for objective tests even more important. Unfortunately highly specific and sensitive tests do not yet exist for thoracic outlet syndrome. There is also very little good data in the literature concerning the tests that do exist.

Standard chest and cervical spine Xrays are helpful in ruling out obvious bony abnormalities such as cervical ribs, narrowed intervertebral spaces or exostoses. Cervical myelograms are also often obtained to check for herniated discs; however, they do not directly help in the diagnosis of thoracic outlet syndromes.

Selective subclavian arteriography has been advocated. This involves injection of radiopaque dye with the arm in several positions in hopes of directly demonstrating compression. When positive, this test is confirmatory of arterial compression, but the sensitivity and specificity of this finding have not been determined. Phlebography has been performed in patients who present with venous symptoms; however,

TABLE 3

Shoulder-girdle-neck Exercises for Thoracic Outlet Syndrome

Shoulder	Stand erect with arms at side, weight in each hand.
Shrug:	Shrug shoulders up and forward and then backward in rotational movement. Repeat ten times.
Arm Raise:	Stand erect with arms out straight from sides at shoulder level, weight in each hand, raise arms sideways with elbow straight, palms down, until backs meet above head.
Neck	Stand erect, bend neck to one side attempting to touch ear to shoulder without shrugging shoulder.
Stretch:	Repeat to other side.
Neck Twist:	Stand erect. Turn head to one side attempting to touch chin to that shoulder without shrugging shoulder. Repeat to other side.

this presentation is rare.

Ulnar nerve conduction velocity has been advocated.^{2,16} In this test an electrical stimulus is introduced into the ulnar trunk proximal to the thoracic outlet, and conduction time to sensors below the outlet is recorded. Urschel believes this test is diagnostic of thoracic outlet syndrome if the conduction velocity is less than 72 m/sec.¹⁶ However, this is disputed.¹¹ Nonetheless electromyography remains a good objective test to rule out nerve entrapment at the wrist or elbow which may be mistaken for thoracic outlet syndrome. One of our patients who experienced a good result from first rib resection had previously undergone carpal tunnel release as well as ulnar nerve transposition without relief of her symptoms.

Recently Doppler ultrasonography has been suggested as a test for the vascular compression syndrome.¹⁰ As with all of these other tests, there is no data upon which to base results.

It would seem reasonable to obtain chest and cervical spine Xrays routinely on suspected thoracic outlet syndrome patients. If cervical root compression is strongly suspected, a myelogram should also be obtained. The EMG is probably better suited to rule out nerve entrapment at other locations rather than to directly diagnose thoracic outlet syndrome.

Current Treatment

Non-operative Treatment

Patients with mild symptoms of fatigue, numbness or tingling of the upper extremity in certain positions require no treatment. Simple reassurance with instructions to avoid whenever possible, positions which cause symptoms may suffice. If the symptoms continue to be bothersome, or interfere with the job or other activities, physio-therapeutic measures should be recommended.⁹ These include exercises aimed at strengthening the shoulder muscles and stretching the neck muscles. A sample exercise program is outlined in Table 3. Some series report 50-70% effective

management by this non-operative form of treatment.⁹ In patients who fail to obtain adequate relief through physiotherapy, or in which arterial, venous or neurologic deficit of sudden onset can be demonstrated, surgical decompression should be seriously considered.

Operative Treatment

Scalenotomy with a failure rate of 60% should no longer be considered adequate treatment. Our series includes one patient who failed to obtain relief from a previous scalenotomy. Claviclectomy has been advocated in special cases, such as for clavicular malunion; however, it is also contraindicated for cosmetic as well as functional reasons. Most surgeons agree that the current treatment of choice is first rib resection via transaxillary approach.¹² This approach allows adequate exposure of the entire thoracic outlet for resection of cervical ribs, exostoses or first ribs. The resulting scar is cosmetically acceptable, and as no muscles are transected, the morbidity is low. Sometimes intercostal brachi nerve trauma cause prolonged post-operative symptoms. The most common complication is intraoperative pneumothorax which can usually be managed intraoperatively and only rarely requires placement of a chest tube. The supraclavicular approach has been all but abandoned due to poor exposure. The posterior approach has been advocated by some for removal of cervical ribs; however, it transects the posterior scapular muscles and is therefore associated with increased morbidity.

Conclusion

Perhaps the proper approach to thoracic outlet syndrome can be summarized thusly: Allow yourself to think of thoracic outlet syndrome in your differential diagnosis of patients presenting with hand, arm, and shoulder symptoms.⁷ Although this is still a difficult condition to diagnose, proper treatment both operative and non-operative can give very gratifying results.

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Minnesota Medical Insurance Exchange

Malpractice Claims Control

MMIE Risk Management Committee
Frank E. Johnson, M.D., Chairman

THIS MONTH marks the start of a new claims prevention series from the Risk Management Department of the Minnesota Medical Insurance Exchange. Recognizing the importance of physician awareness and education in efforts to improve the current malpractice climate, MMIE will report on the incidence and cost of malpractice claims, and offer practical suggestions for identifying and reducing liability hazards. Articles will address such issues as: changes in the laws which affect the practice of medicine, medical record documentation, promoting better communication with patients and other physicians, and the Minnesota Informed Consent doctrine. The series will include topics of interest to nurses, aides and other staff in physicians' offices. MMIE invites your requests for coverage of specific topics.

Malpractice Claims Analysis

In 1980, the National Association of Insurance Commissioners (NAIC) published its report of the most comprehensive review of closed malpractice claims ever conducted in this country. The study reported on 71,782 claims closed between 1975 and 1978, and was based on data from 128 professional liability insurance carriers. Not every malpractice carrier participated, and some of the carriers which provided data did not participate for the years encompassed by the study. The report does offer valuable information for assessing current malpractice trends.

The NAIC study indicated that malpractice claims are both costly and frequent for physicians. Although 61% of the reported cases were closed with no payment to the claimant, the jury awards and settlements made in the remaining cases increased 59% in the average size of payment per physician between 1975 and 1978, to \$32,849. The expenses incurred in handling those claims increased 61% over the three-year period, to an average of \$4,975. Experts state that average indemnity and expense payments have continued to

increase since these values were published. 71% of the total cost of the cases reported was paid on behalf of physicians, 25% on behalf of hospitals, and 4% based on the liability of others. In the NAIC study, Minnesota ranked sixth in total incidents per 100,000 residents (8.57) and eleventh in paid incidents per 100,000 residents (3.54).

Many variations were reported in the particular medical circumstances surrounding the claims analyzed. However, a summary of the data showed that 35% of the paid claims alleged improperly performed procedures, 27% alleged diagnostic errors, 10% involved drug injuries, 3% were attributed to anesthesia injuries, and 15% were related to "all other events." Three of the leading allegations in litigation against surgeons are post-operative complications, inappropriate procedures, and retention of surgical sponges. A frequent allegation in malpractice claims against non-surgical specialties is failure to diagnose primarily cardiac conditions, cancer, or impending birth difficulties.

The fact that 61% of the claims against physicians and hospitals were closed without payment suggests that a large number of cases lack legal or medical merit and are preventable. Many claims are pursued, or lost, not because of actual negligence, but because of an absence of documented informed consent, misunderstanding, or poor doctor-patient rapport. Medical-legal authorities contend that poor medical records are a leading reason otherwise medically defensible cases are settled or lost at trial.

MMIE is supplementing the NAIC data with data gathered from its own claims tracking system, to help develop and expand Risk Management programs for Minnesota physicians. By identifying the most significant problem areas in malpractice and encouraging awareness of the causes and preventable factors underlying claims, MMIE hopes to assist physicians in reversing the increasing costs and frequency of malpractice claims.

Low-Dose Insulin Regimens in the Management of Diabetic Ketoacidosis

Efficacy and Pitfalls

FRED D. HOFELDT, M.D.*† and MICHAEL KELLY, M.D.*

Enthusiastic reports on the dramatic responsiveness of diabetic ketoacidosis to low-dose insulin therapy has led to advocacy of its widespread usage. An illustrated case is presented which describes the pitfalls one may encounter when using a low-dose insulin therapy. Based upon a survey of the literature and the pathophysiological mechanisms operative in treating diabetic ketoacidosis, cautious guidelines are presented for the use of this therapy in the treatment of diabetic ketoacidosis. The accumulated experience regarding insulin therapy indicates that its administration, regardless of whether given as high or low-dose, will effectively manage diabetic ketoacidosis when given repeatedly with careful patient monitoring.

OVER THE PAST decade, new insights into the pathophysiology of diabetic ketoacidosis has led to changes in its management. Cautious guidelines regarding fluid therapy and the use of bicarbonate solutions; attention to precipitating factors and the earlier administration of potassium salts in severely depleted patient have been major areas for change. More recently, there has been those who advocated the use of low-dose insulin therapy.¹⁻⁷ The low-dose insulin therapy can be administered by both intravenous and intramuscular routes. With low-dose insulin therapy, more physiologic plasma levels of insulin are achieved for insulin sensitive tissue. Theoretically, this results in a more predictable rate of normalization of blood glucose and correction of the ketoacidosis. Inasmuch as there are several publications attesting to the efficacy of the low-dose insulin therapy in the management of ketoacidosis, it is the purpose of this publication to review critical guidelines for its use in selective patients knowing the pitfalls that one might encounter when employing this form of therapy in the management of this acute diabetic complication.

Case Report

The patient is a 77-year-old male who was admitted to the hospital with a three-week history of weakness, polyuria, polydipsia, nocturia and weight loss. Over the two days prior to admission, the patient developed shortness of breath, difficulty breathing, and mental confusion. The patient had a past medical history of myocardial infarction in 1950. The patient's family history was

negative for diabetes. His wife had expired two months earlier of a prolonged terminal illness.

On admission, the patient appeared as an elderly, apprehensive, confused male in moderate distress with labored respirations and an "acetone" smell to his breath. His weight was 159 pounds; height was 5'7"; blood pressure was 140/170; pulse was 110. Significant physical findings revealed evidence of dehydration with poor skin turgor, collapsed neck veins and shrunken eye balls. There was no evidence of diabetic retinopathy. Decreased vibratory sense of the lower extremities and absent ankle jerks were noted bilaterally. Admission laboratory data showed a blood sugar of 540 mg/100 ml, potassium 4.5 meq/liter, sodium 143 meq/liter, bicarbonate 17.5 meq/liter, chlorides 110 meq/liter, measured serum osmolality of 345 milliosmoles/kg, and a calculated anion gap of 20. The patient's acetone was strongly positive at a 1 to 15 dilution; arterial pH was 7.32. The patient's diabetic ketoacidosis was treated by giving intravenously 25 units of regular insulin as a bolus followed by a saline infusion with 0.1 of a unit of regular insulin per kilogram body weight per hour. Fluids of half-normal saline alternating with normal saline were used for correction of the hyperosmolality. Within two hours, the patient had a blood glucose of 250 mg/100 ml., arterial pH was 7.35, potassium 3.3 meq/liter, bicarbonate 12.8 meq/liter. Dextrose and potassium solutions were begun. After an additional three hours, serum acetone was strongly positive only in the undiluted serum. Arterial pH was 7.4, potassium was 4.1 meq/liter and the bicarbonate was 21 meq/liter. At this time, the insulin infusion was discontinued, and the patient was placed on subcutaneous insulin at six hour intervals with 5% dextrose in water running at 125 ccs per hour, with replacement potassium solution. The patient's convalescence from the diabetic ketoacidosis was without further difficulty and he was discharged from the hospital on a single morning insulin dose of 30 units of NPH and five units of regular insulin which resulted in a normal plasmic glucose profile and adequate control of glycosuria as measured by a 24-hour urine glucose.

Discussion

Diabetic ketoacidosis is a condition which develops

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in the setting of a relative or absolute insulin deficiency. The subsequent events which cause an increasing blood glucose level and acidosis lead to a urinary osmolar loss of glucose, electrolytes and water which promote dehydration and hypovolemia. There have been many proposed standard guidelines for the therapeutic management of these patients. Insulin is essential to reverse the disturbances in intermediary metabolism along with supportive therapy to correct the electrolyte imbalance and fluid depletion. There are many different insulin regimens proposed to treat severe diabetes mellitus which vary from using initial doses of 50 to 300 units of insulin given by various routes to include intravenous, intramuscular, subcutaneous or combinations thereof. Other schemes have based initial insulin dosage upon serial serum acetone dilutions. In the mid-1970s, enthusiastic reports appeared from a number of European countries, Australia and the United States that low-dose insulin infusion can adequately correct the diabetic ketoacidosis state at a rapid and predictable rate.⁸

The continuous-insulin infusions deliver a prescribed insulin dosage per kilogram of body weight (generally 0.1 unit of regular insulin/kg/hour). There are various methods for administering the insulin. The solution can be conventionally administered with an infusion pump, 50 cc syringe and sterile extension tubes with a 23 butterfly infusion set. A modification of this system is to use a pediatric infusion set with 50 units of regular insulin in 500 cc of normal saline (insulin concentration is 0.1 unit of insulin per cc). Thus a 70 kilogram man receiving 0.1 unit of insulin/hour would be infused at the rate of 70 cc per hour (seven units insulin/hour).

To alleviate the difficulty of insulin binding to glass and plastic surfaces,⁹ the addition of human serum albumin has been advocated. Recently, it has been suggested by Peterson, et al.,¹⁰ that the infusion mixture can be expected to deliver approximately 100% of the insulin if the first 50 cc volume is discarded after running through the plastic tubing. Using this wash-through procedure, no extra protein additives are necessary.

An editorial has cautioned physicians as to the overzealous use of this method to treat diabetic ketoacidosis.¹¹ It has become apparent with further widespread usage of low-dose insulin therapy that a number of pitfalls have emerged which limit its usefulness. Our patient demonstrates the characteristic trend that one might see when a diabetic patient is treated with low-dose insulin therapy. The patient was sufficiently dehydrated and acidotic to clinically present with Kussmaul's respiration, dehydration and

severe hyperglycemia. The patient's total insulin therapy to treat and resolve the hyperglycemia was 27 units by infusion plus the initial 25 units insulin bolus. Early in the treatment course, it will be noted that his blood glucose was brought relatively quickly under control reaching values of 250 mg/100 ml within a few hours in therapy. However, at this time, he remained profoundly acidotic with a large unmeasured anion gap and evidence of arterial acidosis with a depressed bicarbonate level. Had the patient's continuous-insulin infusion been discontinued at this time, the metabolic state would have reversed itself and persistent hyperglycemia would have returned and ketoacidosis would have worsened.

The intravenous administration of insulin has the advantage of being rapidly metabolized as the plasma half-life is about 5 to 8 minutes when given intravenously. This short half-life lessens the risk of hypoglycemia once the insulin infusion is stopped.

When using this method, it is important to recognize that the blood sugar might rapidly be brought under control while the acidosis persists. In these circumstances, the insulin infusion must be continued and glucose solutions administered. Likewise, it is important to maintain blood glucose at about 250 mg/100 ml to prevent a large osmolar gradient between central nervous system tissue and extracellular fluids and thus avoid cerebral edema.

The late response of the acidosis to insulin therapy has been a finding not previously well-recognized. It most likely has been "masked" by the initial subcutaneous insulin administration as outlined in former treatment programs. A study by Soler et al.⁷ reported that when insulin is given by either the intravenous or intramuscular route, hourly or continuously, without a priming subcutaneous dose that there is a significant time lag between control of blood glucose (to less than 250 mg/100 ml) and correction of the acidosis. Noteworthy was that when the insulin was given by continuous infusion, there was the greatest time differential between these two variables. This study documents the delayed interval needed for correction of the acidosis and explains the refractoriness that has been encountered with the continuous low-dose infusion. Previous studies not showing this delay most likely have been "masked" by subcutaneous administration of insulin early in the treatment course. This study by Soler et al.⁷ also demonstrates that with small-dose insulin therapy, there is poor retention of body potassium. Overall potassium requirement during all low-dose treatment programs was identical. The poor potassium retention with a low-dose insulin therapy may lead to a late onset hypokalemia at a time

when intravenous infusions may be stopped and potassium replacement has been inadequate. This tendency toward late hypokalemia contradicts early claims that low-dose insulin treatment would result in a reduced potassium requirement during treatment of the diabetic ketoacidosis. The poor potassium retention observed with the low-dose continuous or intermittent therapy may be a reflection of the prolongation of the acidosis.

The conclusion of the Soler et al.⁷ was that in the management of diabetic ketoacidosis, the mode of insulin administration is of limited significance and that low-dose insulin therapy, although effective, is not superior to conventional large-dose therapy. Thus, there are a number of pitfalls associated with

low-dose insulin therapy to include the cumbersome equipment required (infusion pumps or pediatric infusion sets), the problems of adherence of insulin to intravenous tubing and glassware, the findings of prolongation of acidosis and its slow response to therapy, the difficulty of potassium retention, and the need to follow blood glucose levels closely to avoid hypoglycemia. However, despite these problems, the more widespread use of the low-dose insulin infusion technique has definitely been a significant milestone in our progress to treat hyperglycemic states, hyperosmolar coma and diabetic ketoacidosis. Realizing these few limitations, the physician is better able to manage the acutely ill diabetic.

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Echoes from Our Past

Vengeance ds grenouille

JACK D. KEY, M.A., M.S.*

An epidemic of priapism is a recent medical curiosity related by a French army surgeon. The troops while marching through northern Africa halted at a station where nearly all the men were seized with prolonged and painful erections, followed by lassitude, dryness of the throat and finally in some cases by haematuria. Investigation showed that the men had eaten freely of frogs killed on the banks of a neighboring stream. Over the stream hung willow and poplar trees upon whose branches were numerous insects of the family of cantharides. These insects fell into the stream, were eaten by the frogs and the frogs in time were eaten by the soldiers. The taste of the flesh of the frogs was said to have been in no way affected by their aphrodisiac diet.¹

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The Physician As Artist —

An Exhibit of Original Art by Minnesota Physicians

An Exhibit of Original Art by Minnesota Physicians
Sponsored by the Minnesota Medical Association
At Its 1983 Annual Meeting, May 18-20, 1983
Radisson South Hotel, Bloomington

The Annual Meeting Planning Committee for the 1983 MMA Annual Meeting wishes to repeat the physicians' art show. The art show will be open during exhibit hours on Thursday and Friday, May 19-20, 1983.

If you would like the opportunity to exhibit your work to your physician colleagues, please send in the form below *today* so that space can be reserved for your exhibit. We will send more complete information and an official application form in February.

A nominal fee will be charged to defray the cost of security. This can be submitted with the *official application form* to confirm your entry.

Do you know another physician who is an artist? Why not pass along this announcement?

"The Physician as Artist" — Tentative Space Reservation

Please reserve space for me on a tentative basis for an exhibit at "The Physician as Artist", MMA Annual Meeting, May 18-20, 1983, and send further details and an application form.

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OFFICE PHONE _____ HOME PHONE _____

The category of the item I wish to exhibit is:

(Check one — available space will allow only *one entry per individual*)

<input type="checkbox"/> Oils	<input type="checkbox"/> Drawings	<input type="checkbox"/> Ceramics
<input type="checkbox"/> Acrylics	<input type="checkbox"/> Watercolors	<input type="checkbox"/> B/W Photography
<input type="checkbox"/> Sculpture	<input type="checkbox"/> Woodcarvings	<input type="checkbox"/> Colored Photography

Estimated dimensions/size: _____

PLEASE SUBMIT THIS RESERVATION BY *February 1, 1983* SO THAT AN OFFICIAL APPLICATION FORM CAN BE SENT.

Please send to: Dept. of Education & Specialty Affairs, Minnesota Medical Association,
2221 University Avenue S.E. — Suite 400, Minneapolis, Minnesota 55414.

Facial Injuries in Sports

THOMAS CHRISTIANSEN, M.D.* and KENT WILSON, M.D.†

THE FACIAL SKELETON is at risk of injury in many sports. Recently, preventive efforts have reduced the incidence of such injury in several sports. Understanding the causes of facial injuries can contribute to a reduction in the frequency of their occurrence while prompt evaluation and treatment will reduce late deformity.

Anatomy and Function

Figure 1 demonstrates the anatomy of the facial skeleton. Each individual's dentition creates his own occlusion for normal bite in which the teeth meet properly to aid in mastication. The pyriform aperture is the osseous opening of the nasal cavity into the skull. Much of the nasal structure is composed of cartilage, including the septum which divides this cavity into two halves. The roof of the nose is formed by two nasal bones and distal cartilage. Functionally, the nose warms, cleans and humidifies the air we breathe and receives drainage from the sinus cavities. Injury commonly leads to deformity of the delicate structures of the nose and loss of proper function.

The malar bones (zygomatic bones) extend forward and sideways from the maxilla. Together with frontal and maxillary bones, these structures contribute significantly to the framework of the orbit (Figure 1). Fractures of the malar bone commonly lead to a flattening of the cheek, but may be severe enough to damage the eye or its attached muscles.

Types of Injuries Recognition

A facial fracture is not often a medical emergency, however, prompt recognition is desirable so that correct treatment planning and first aid may be carried out. These fractures may be displaced in which case proper repositioning is necessary to restore both form and function. In the case of a fracture where the bones have not moved, support may be required to promote satisfactory healing. Long-term disability caused by a

non-healed or misaligned fracture can be a significant problem and must be avoided.

The recognition of a facial fracture follows a stepwise analysis of the injured player: (1) Inquire how the teeth fit together with the jaws tightly closed. If the teeth feel out of line, suspect a jaw fracture. (2) Have the individual bite down forcefully upon a tongue blade. He will have pain at the site of a jaw fracture, if one exists. (3) Perform a systematic palpation and inspection of the facial features comparing the balance between the two halves of the face. Pay particular attention to the bony rim of the orbit, looking for a "step-off" (or deformity) as a result of a fracture. If the nose is broken, displacement and movement of the nasal bones will be felt long before the swelling subsides enough to unveil a deformity. Understanding the anatomy discussed above will help in recognizing these fractures. (4) Check the individual's vision by

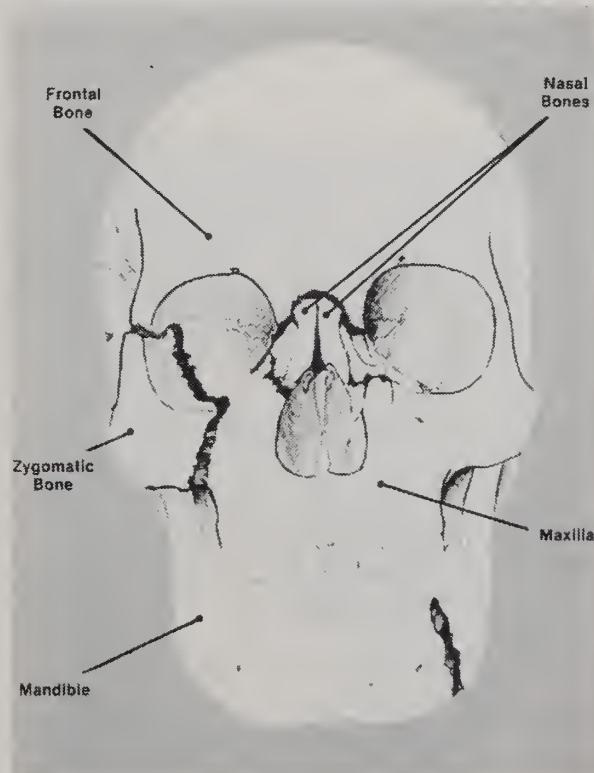


Figure 1

*Otolaryngologist in private practice in Minneapolis, and clinical assistant professor of otolaryngology at the University of Minnesota.

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asking him to read fine print, and move his eyes in all directions. Inquire about any double or blurred vision.

There are associated injuries of the head and neck related to facial fractures that must be treated as life threatening.

1. **AIRWAY** — This may be impaired by blood clots, loss of support from a fractured jaw or larynx (voice box), swelling of the tongue, and aspiration of foreign material or tooth fragments. Proper positioning of the tongue and lower jaw may restore an impaired airway, while sweeping the mouth with a finger may clear the passage.
2. **NECK** — Before moving the patient consider the chance of spinal cord injury.
3. **HEMORRHAGE** — The most troublesome bleeding comes from the nose and can usually be controlled with finger pressure. Correct positioning of the head and the use of plastic airways by qualified personnel may be needed to keep the airway open in an unconscious or neck-injured individual. Otherwise, an alert person can lean forward or turn to the side in order to clear blood and secretions from the nasal and throat passages. Discourage swallowing of blood as it leads to nausea and vomiting. Rarely does life-threatening blood loss occur in facial injuries. Usually there is time for careful transfer to the hospital setting.
4. **BRAIN** — Consider concussion in every instance of facial fracture, and strictly forbid return to activity.

Throat

Any injured player who has signs of a fracture of the larynx including stridor, hoarseness or loss of voice, or a crackling or gritty sensation in the tissues of the neck should see an Otolaryngologist immediately. Coughing, wheezing, or labored breathing may indicate aspiration of material into the lung and demands immediate treatment.

Eye

Ocular injuries are discussed in detail elsewhere, however, it is important to be aware of conditions that require immediate referral to an eye specialist. Such conditions include globe pain, loss of vision, laceration of the eyelid, collection of blood in front of the pupil, inability of the iris to dilate or constrict, and any injury puncturing the eyeball. Evaluation of the eye is necessary with fractures of the bones.

Nose

Nasal fractures are the most common facial fracture. In the absence of more serious injury, many athletes have continued participation with nasal fractures.

However, this should never be demanded of an individual. A fractured nose is often properly positioned after the swelling subsides, but cartilage injury and hematoma may require more immediate attention. The nose must be examined by a physician *soon* after the injury.

Teeth

Dental injuries must not be ignored. Encourage players to seek treatment of damaged teeth as this may save teeth from being lost or subject to more extensive dental work. A totally avulsed (knocked out) tooth stands a reasonable chance of survival if reimplanted immediately. Keep the tooth moist and wrapped in a clean cloth or gauze pad and transport the athlete to an oral surgeon.

Jaw

Any athlete with a jaw fracture must not continue in athletic activity. Mandible and maxillary fractures are always compound into the oral cavity and therefore antibiotic treatment is required to prevent infection. These fractures must be evaluated by a qualified specialist.

Prevention of Injuries

There have been improvements in equipment that have decreased facial injuries in athletics. Understanding the nature of individual sports and those patterns of play which affect the risk of injury are important in making activities safer. Those factors which influence the occurrence of injuries include the attitude, experience, and competence of coaches, players, and officials. In addition, a player's personal equipment, the playing surface, and structures on and around the playing surface may be associated with injuries.

Equipment

The basic principle employed in nearly all protective equipment is that of changing a force concentrated on a small area by distributing it over a large area, thus reducing the energy transmitted to any single region. A second principle of protection is diminishing the impact energy by employing padding which absorbs energy by becoming deformed. Both of these principles are illustrated in the modern foam-padded helmet in which the energy of impact transmitted to the player's head from a blow is distributed over a large surface area through the structure of the helmet and is reduced by deformation of the foam padding.

Diamond Sports

Diamond Sports (baseball, softball) have a

significant risk of facial injury associated with the catching position. The catcher's face mask is an example of the distribution of the energy applied to small area being diffused over a large area and of padding being used to absorb energy. While we are all familiar with the necessity for facial protection for a catcher, it has recently become apparent that there is a risk of injury to the throat (larynx and trachea) and that to reduce this risk a throat protector should extend from the lower portion of the face mask to the level of the collarbone (Figure 2).



Figure 2

Football

Football is a sport in which facial protection has been much improved. However, there remains a significant risk of injury because of the variety of facial protective equipment currently used. The full cage facemask adequately protects its wearer from the usual injuries. There is significant weight and some reduction of visibility involved in the use of this mask. Therefore, backs and receivers tend to use a half cage or partial facial protector which allows fractures of the cheek or nose and lacerations of the upper portion of the face. It is extremely important that the role of a dental guard inside the mouth be recognized in football facial protection. It has clearly been demonstrated that the application of mandatory facial protection as well

as the use of mandatory dental guards has resulted in a reduction in football facial injuries. The dental guard acts by cushioning blows to the lower jaw and decreasing the likelihood of upper and lower jaw fractures and broken teeth.

Hockey

Hockey is a sport which has recently undergone the transition to full facial protection and the use of a dental guard in the mouth. Rule changes mandating this facial protection resulted when data demonstrated that non-goalie players were at significant risk of injury from a variety of causes, most frequently the stick. Approximately 60 percent of all facial injuries in hockey result from contact with a stick in non-goalie players.¹ The use of full facial protection in hockey has drastically reduced the frequency of facial injury, including lacerations, fractures, and dental injuries (Figure 2).

The goalie in hockey is at significant risk of injury both to the face as well as to the throat. The earliest forms of goalie facial protection were fiberglass masks supported by the facial bones. There have been several instances in which fractures of the facial bones occurred as a result of high speed puck contact. For this reason it is recommended that goalies use a helmet with an attached wire mesh mask which prevents the puck from making contact with the facial bones. The wire mesh mask supported by the helmet not only diffuses the energy of the puck's impact over a large area, but may also absorb energy by acting as a cushion. Goalies



Figure 3

should also wear a throat protector similar to those used by baseball catchers.

Racquet Sports

There is an increasing recognition that racquet sports (squash, handball, racquetball, tennis) pose a significant risk of eye injury. Although there is a high risk of facial injury, the nature of these games is such that the use of full face masks would be extremely cumbersome and consequently change the basic nature of the game. However, there is sufficient risk to the eye that lightweight guards have been developed to prevent either a racquet blow or the ball from entering the orbit and causing significant eye injury (Figure 3). It is strongly recommended that any player involved in these games use an eye guard to reduce the risk of serious eye injury or blindness.

Injuries to the face can have serious cosmetic and physical effects. Early recognition and treatment of these injuries is mandatory to minimize these effects. More importantly, prevention of facial injuries is possible through an understanding of the mechanisms of injury and developing proper protective equipment.

Summary

1. Facial fractures are not often a medical emergency but prompt recognition and correct treatment can prevent long-term disability and deformity.
2. Always be aware of the possibility of serious head and neck injury which may accompany facial injuries.
3. Fractures of the voice box or injuries to the eye area

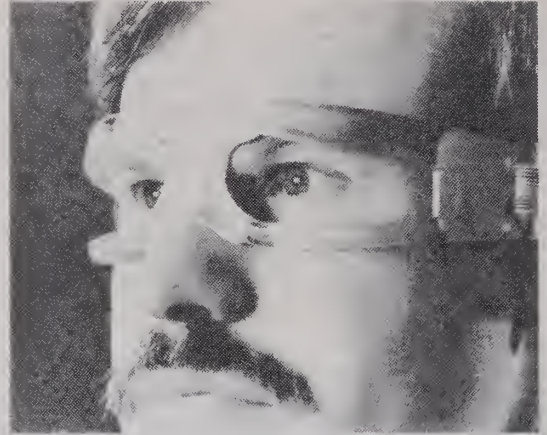


Figure 3

require immediate attention of a specially trained physician.

4. Athletes with a fractured jaw or nose should not be returned to play before being examined by a physician.
5. Factors which influence the occurrence of injuries include: attitude, experience, and competence of players, coaches, and officials as well as equipment, playing surfaces, and structures on and around the playing surface.
6. Proper protective equipment to prevent facial injuries is available and should be required for baseball catchers, football players, hockey players, and those participating in racquet sports.

Acknowledgments

Photographs by Ned Gardner and David Steinbring.
Assisted by Robert C. Finke and Susan Goodwin Gerberich.

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Physicians in the News

John E. Woods, M.D., a Rochester plastic surgeon, was elected 1982-83 Vice-President of the Plastic Surgery Educational Foundation during the Foundation's Annual Scientific Meeting held in conjunction with the American Society of Plastic and Reconstructive Surgeons, Inc. (ASPRS) from October 10-15 in Honolulu, Hawaii.

Giant Cell Arteritis

An Additional Cause for Fever of Unknown Origin

PAUL C. FLORELL, M.D.;* LINDA SANDHAUS, M.D.;* and M. THOMAS STILLMAN, M.D., F.A.C.P.*

Giant cell arteritis (GCA) may present classically with painful, palpable temporal arteries and headache; as the polymyalgia rheumatica syndrome or in a systemic manner with fever, weight loss and malaise. It should be included as well in the differential diagnosis of fever of unknown origin (FUO) in elderly patients. We present here a case report of GCA with this presentation.

GIANT CELL ARTERITIS (GCA) is a disease of the elderly, rarely occurring before the age of fifty. It is slightly more common in women and has a predilection for Caucasians particularly those living in the northern latitudes or those of scandinavian descent.¹ In Olmstead County, Minnesota, the overall annual incidence of GCA was between 2.4 — 2.9/100,000 with an annual incidence of 17.4/100,000 or those fifty years of age or older.²

GCA involves any large or medium sized elastic artery. The signs and symptoms of GCA are secondary to the inflammation and occlusion of the involved vessels. It may therefore present with purely localized symptoms (visual changes; jaw claudication; headaches; tender, swollen temporal arteries) or generalized symptoms of inflammation (fever, weight

loss, malaise). This disparity may cause a significant delay in arriving at the diagnosis, with early recognition of the classic presentation (increased erythrocyte sedimentation rate, headache, tender temporal arteries, blindness) to a long delay and protracted evaluation when presenting as a systemic illness. In one retrospective study of biopsy proven GCA involving one hundred patients, fifteen presented as fever of unknown origin (FUO).³ In this study, in 11/15 a presumptive diagnosis was made leading to temporal artery biopsy based on new findings obtained from re-exam and re-questioning. These findings were new or changing, headache, temporal artery tenderness, jaw claudication, or symptoms suggesting polymyalgia rheumatica. However, in 4/15 the diagnosis was made by random biopsy in absence of any symptoms or signs of GCA. Another retrospective study of 111 cases presenting as FUO in patients 65

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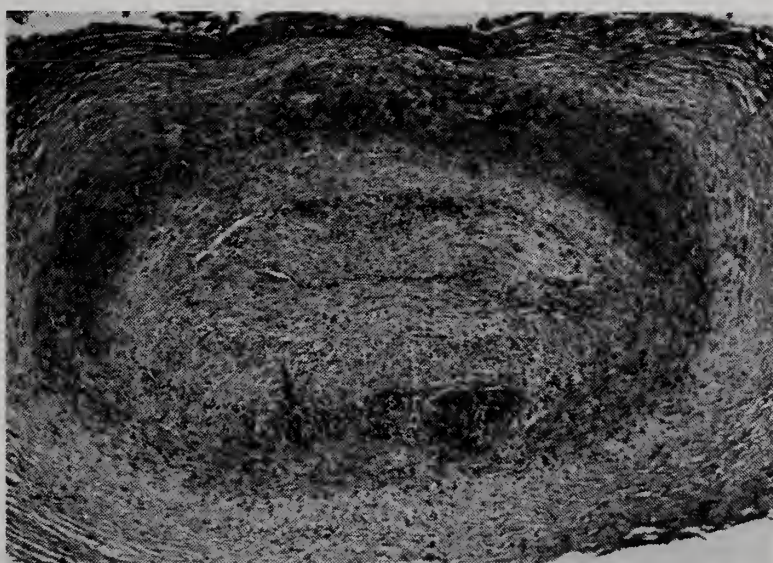


Figure — Cross section of left temporal artery showing giant cell arteritis (arrows).

years of age or older found 18/111 (16%) having GCA as the etiology. 15/18 were biopsy proven.⁴ In this study the majority (13/18) ultimately developed symptoms suggesting GCA leading to the diagnosis, however, 5/18 did not or were not recorded. In contrast to the above, Petersdorf and Beeson's classic analysis of FUO in 100 patients found only two with GCA.³ The following case exemplifies the necessity of considering GCA presenting as an FUO in an elderly individual.

Case Report

A 64-year-old Caucasian female developed diarrhea, sore throat and ear ache two months prior to admission. She was treated with penicillin and her symptoms resolved. Shortly thereafter she developed fever with symptoms of a urinary tract infection. She received a course of Trimethoprim-sulfamethoxazole with resolution of her symptoms but persistence of fever. An outpatient evaluation, including a normal intravenous pyelogram did not establish an etiology for her protracted febrile course. She was admitted to the hospital for further investigation. The patient's main complaints were malaise, fatigue and night sweats associated with a twelve to fifteen pound weight loss over two months. Daily fever spikes up to 102 degrees were documented. She underwent an extensive evaluation and the following pertinent data was obtained: Hemoglobin 9.5 gr%; white blood count 10,700/cumm with a slight left shift; platelets 490,000/cumm; erythrocyte sedimentation rate (Westergren) 146mm/hr; reticulocyte count 1.5%; serum iron 8 mcg/dl; total iron binding capacity 174 mcg/dl; iron saturation 5%; Ferritin 840 ng/ml (nl 10-300 ng/ml); normochromic, normocytic peripheral smear; bone marrow biopsy unremarkable except for one epithelioid granuloma; serum protein electrophoresis revealed no monoclonal spike, a reduced albumin and increased alpha-2 fractions; urinalysis was normal. All cultures (bone marrow, cerebro-spinal fluid, blood, urine and sputum) including acid fast smears and cultures were negative. Serology for VDRL, cryoglobulins, Coombs, rheumatoid factor and cryptococcal antigen was negative. A PPD skin test was negative with a positive mumps control. Her T₄ by radioimmunoassay, T₃ resin uptake, normalized T₄, electrolytes, calcium, phosphorus, magnesium, and creatinine were normal. The SGOT and bilirubin were normal, but there was a slight elevation of the

alkaline phosphatase to 86 mU/ml (nl 24-80 mU/ml). The chest x ray, renal and gallbladder ultrasounds were normal.

Upon further questioning, the patient described a dull-nonspecific headache more prominent on the right in the posterior-occipital region with radiation over the right ear. Bilateral temporal artery biopsies were obtained and the patient was begun on 60 mg. of Prednisone a day for a presumptive diagnosis of GCA.

Portions of the left and right temporal arteries were submitted for pathological examination. The arterial segments averaged 2.5 cm in length and were smooth and uniform in appearance. Serial sections of both temporal arteries showed a continuous panarteritis with histological features diagnostic of GCA. The characteristic inflammatory changes included: (1) a transmural mononuclear cell infiltrate, (2) granulomatous inflammation with multinucleated giant cells associated with fragmentation of the internal elastic lamina, and (3) intimal proliferation and thrombosis (Figure). Involvement of the left temporal artery was somewhat greater than the right temporal artery.

The patient's symptoms rapidly resolved within 48 hours and on follow-up one week later had normalized her erythrocyte sedimentation rate.

Discussion

The purpose of this case report is to demonstrate GCA may present as an FUO. Frequent reexamination and interrogation may be necessary to alert the clinician to symptoms suggesting GCA. It is reasonable to consider temporal artery biopsy in FUOs prior to embarking on more hazardous and costly procedures. One should include GCA in the differential diagnosis of an elderly patient with fever and abnormal laboratory studies which include an elevative erythrocyte sedimentation rate, alkaline phosphatase, platelets, depressed albumin, and an anemia of chronic disease.

Since GCA may be associated with a 30-50% occurrence of irreversible visual loss,¹ establishing a diagnosis and early initiation of treatment is of the utmost importance.

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Continuing Medical Education Scientific/Ski Meeting

The Northwestern Medical Association convenes for its 36th Annual Meeting at Sun Valley, ID, from February 7 to 11, 1983. Transplants-implants, general medical subjects, ski-injury prevention, high-altitude physiology and financial planning will be discussed by experts. Approved for 10 CME Category I credits. Registration 3 to 5 p.m. on February 7, Challenger Inn, Sun Valley. Non-members registration \$100. For information, write to Norman Christensen, M.D., 2456 Buhne Street, Eureka, CA 95501 or phone (707) 443-2248.

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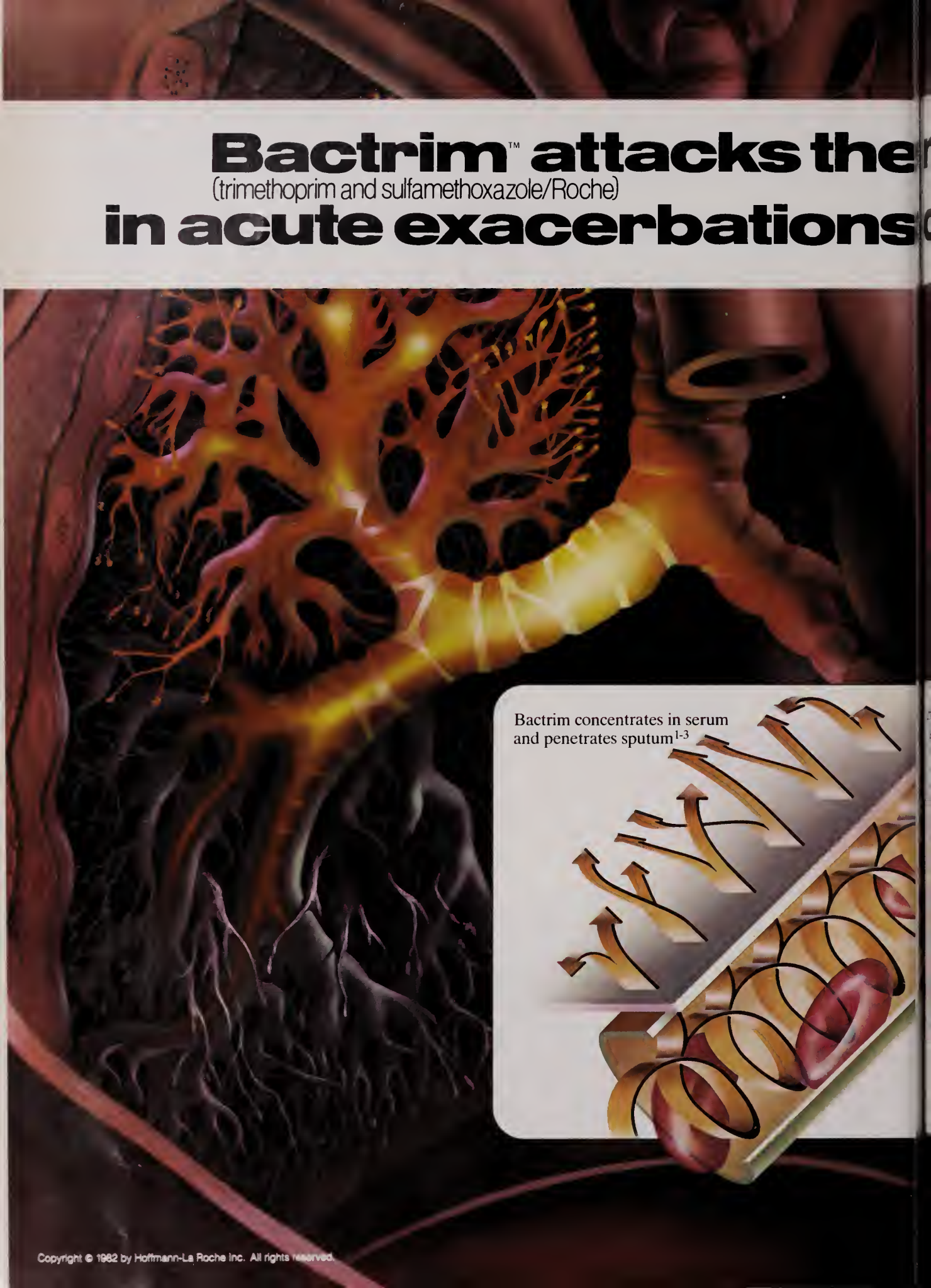
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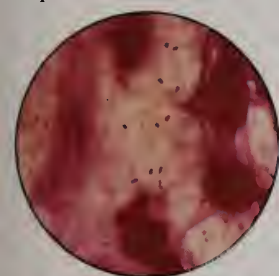
involving nearly 700 patients.¹⁰ Overall clinical condition of the patients, changes in sputum purulence, reduction in sputum volume and microbiological clearance of pathogens—all improved more with Bactrim therapy than with tetracyclines. G.I. side effects occurred in only 7% of patients treated with Bactrim compared with 12% of tetracycline-treated patients. (See Adverse Reactions in summary of product information on next page.)

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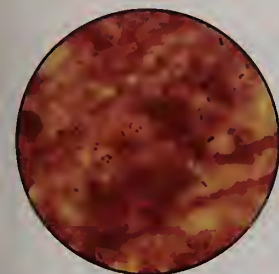
Bactrim DS. For acute exacerbations of chronic bronchitis in adults* when it offers an advantage over single-agent antibacterials.

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Indications and Usage: For the treatment of urinary tract infections due to susceptible strains of the following organisms: *Escherichia coli*, *Klebsiella-Enterobacter*, *Proteus mirabilis*, *Proteus vulgaris*, *Proteus morganii*. It is recommended that initial episodes of uncomplicated urinary tract infections be treated with a single effective antibacterial agent rather than the combination. *Note:* The increasing frequency of resistant organisms limits the usefulness of all antibacterials, especially in these urinary tract infections. For acute otitis media in children due to susceptible strains of *Haemophilus influenzae* or *Streptococcus pneumoniae* when in physician's judgment it offers an advantage over other antimicrobials. To date, there are limited data on the safety of repeated use of Bactrim in children under two years of age. Bactrim is not indicated for prophylactic or prolonged administration in otitis media at any age. For acute exacerbations of chronic bronchitis in adults due to susceptible strains of *Haemophilus influenzae* or *Streptococcus pneumoniae* when in physician's judgment it offers an advantage over a single antimicrobial agent. For arthritis due to susceptible strains of *Shigella flexneri* and *Shigella sonnei* when antibacterial therapy is indicated.

Also for the treatment of documented *Pneumocystis carinii* pneumonia.

Contraindications: Hypersensitivity to trimethoprim or sulfonamides; patients with documented megaloblastic anemia due to folate deficiency; pregnancy at term; nursing mothers because sulfonamides are excreted in human milk and may cause kernicterus; infants less than 2 months of age.

Warnings: BACTRIM SHOULD NOT BE USED TO TREAT STREPTOCOCCAL PHARYNGITIS. Clinical studies show that patients with group A β -hemolytic streptococcal tonsillopharyngitis have higher incidence of bacteriologic failure when treated with Bactrim than do those treated with penicillin. Deaths from hypersensitivity reactions, agranulocytosis, aplastic anemia and other blood dyscrasias have been associated with sulfonamides. Experience with trimethoprim is much more limited but occasional interference with hemopoiesis has been reported as well as an increased incidence of thrombopenia with purpura in elderly patients on certain diuretics, primarily thiazides. Sore throat, fever, pallor, purpura or jaundice may be early signs of serious blood disorders. Frequent CBC's are recommended, therapy should be discontinued if a significantly reduced count of any formed blood element is noted.

Precautions: General: Use cautiously in patients with impaired renal or hepatic function, possible folate deficiency, severe allergy or bronchial asthma. In patients with glucose-6-phosphate dehydrogenase deficiency, hemolysis, frequently dose-related, may occur. During therapy, maintain adequate fluid intake and perform frequent urinalyses, with careful microscopic examination, and renal function tests, particularly where there is impaired renal function. Bactrim may prolong prothrombin time in those receiving warfarin, reassess coagulation time when administering Bactrim to these patients.

Pregnancy: Teratogenic Effects. Pregnancy Category C. Because trimethoprim and sulfamethoxazole may interfere with folic acid metabolism, use during pregnancy only if potential benefits justify the potential risk to the fetus.

Adverse Reactions: All major reactions to sulfonamides and trimethoprim are included, even if not reported with Bactrim. *Blood dyscrasias:* Agranulocytosis, aplastic anemia, megaloblastic anemia, thrombopenia, leukopenia, hemolytic anemia, purpura, hypoproteinemia and methemoglobinemia. *Allergic reactions:* Erythema multiforme, Stevens-Johnson syndrome, generalized skin eruptions, epidermal necrolysis, urticaria, serum sickness, pruritus, exfoliative dermatitis, anaphylactoid reactions, periorbital edema, conjunctival and scleral injection, photosensitization, arthralgia and allergic myocarditis. *Gastrointestinal reactions:* Glossitis, stomatitis, nausea, emesis, abdominal pains, hepatitis, diarrhea, pseudomembranous colitis and pancreatitis. *CNS reactions:* Headache, peripheral neuritis, mental depression, convulsions, ataxia, hallucinations, tinnitus, vertigo, insomnia, apathy, fatigue, muscle weakness and nervousness. *Miscellaneous reactions:* Drug fever, chills, toxic nephrosis with oliguria and anuria, periarteritis nodosa and L.E. phenomenon. Due to certain chemical similarities to some goitrogens, diuretics (acetazolamide, thiazides) and oral hypoglycemic agents, sulfonamides have caused rare instances of goiter production, diuresis and hypoglycemia in patients; cross-sensitivity with these agents may exist. In rats, long-term therapy with sulfonamides has produced thyroid malignancies.

Dosage: Not recommended for infants less than two months of age.

URINARY TRACT INFECTIONS AND SHIGELLOSIS IN ADULTS AND CHILDREN, AND ACUTE OTITIS MEDIA IN CHILDREN.

Adults: Usual adult dosage for urinary tract infections—1 DS tablet (double strength), 2 tablets (single strength) or 4 teasp. (20 ml) b.i.d. for 10-14 days. Use identical daily dosage for 5 days for shigellosis.

Children: Recommended dosage for children with urinary tract infections or acute otitis media—8 mg/kg trimethoprim and 40 mg/kg sulfamethoxazole per 24 hours, in two divided doses for 10 days. Use identical daily dosage for 5 days for shigellosis.

For patients with renal impairment: Use recommended dosage regimen when creatinine clearance is above 30 ml/min. If creatinine clearance is between 15 and 30 ml/min, use one-half the usual regimen. Bactrim is not recommended if creatinine clearance is below 15 ml/min.

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Recommended dosage: 20 mg/kg trimethoprim and 100 mg/kg sulfamethoxazole per 24 hours in equal doses every 6 hours for 14 days. See complete product information for suggested children's dosage table.

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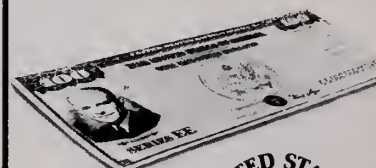
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Drug Profiles

Isosorbide Dinitrate

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Like nitroglycerin, isosorbide dinitrate is an organic nitrate vasodilator acting predominantly on the venous side. Used for congestive heart failure, it is the most frequently prescribed vasodilator in Minnesota.

Absorption

Well absorbed but undergoes extensive first-pass effect when given orally. This may be circumvented by administering the drug sublingually. With the sublingual form the onset is within seconds to minutes with a duration of 1.5 to three hours. The oral tablet has an onset within 15 minutes (some say up to 30 minutes) and a duration of four to six hours. The chewable form is similar to the oral but gives a quicker onset.

Distribution

Upon reaching the systemic circulation the drug is rapidly incorporated into the cells lining the blood vessels where it exerts its effect on vascular smooth muscle.

Metabolism

The drug undergoes extensive metabolism by the liver. The activity of its metabolites on the vasculature system are considered to be unimportant.

Excretion

Virtually all the drug is excreted into the urine as inactive metabolite.

Half-Life

Because of extensive metabolism and rapid incorporation into vascular smooth muscle the half-life of this drug is not considered clinically important to dosage considerations.

Interactions

There will be a potentiation of the drug's effect when used with other vasodilators or alcohol.

When used orally the drug should be taken on an empty stomach for maximum effectiveness.

Dosage Considerations

Because of the drug's rapid effect and ability to cause a degree of hypotension, nausea, headache, dizziness and syncope, therapy should be initiated with low doses. When used for angina the drug may be helpful prophylactically two to three minutes sublingually, before the onset of activity which causes anginal pain. The drug may have to be used with short dosage intervals for chronic angina and when used for congestive heart failure.

Clinical Comments

Isosorbide dinitrate dilates both venous, capacitance, and arteriolar resistance vessels. This dual action is seen more with the sublingual and chewable forms, with the oral form exhibiting its clinical effect on the venous system almost exclusively.

The drug will reduce pulmonary vascular congestion with less of an effect on increasing cardiac output. For this reason the drug is useful in congestive heart failure when combined with an arteriolar dilator.

Because some studies have shown a reduction in pO₂ after start of therapy, thought to be due to vasodilation of underperfused pulmonary vessels with increased ventilation perfusion mismatching, blood gases should be monitored in critically ill patients.

Many elderly patients take peripheral vasodilators along with their other drug therapy. It may be better for these patients especially to take their dose of nitrate in a sitting position to combat any dizziness or syncope episodes.

*Pharm. D. Resident, College of Pharmacy, University of Minnesota, Minneapolis.

Sorbitrate® contains tartrazine which may cause allergic reactions. Although the incidence of this type of reaction is low, it is more frequent in those patients exhibiting a hypersensitivity to aspirin.

Chronic long term use of nitrates has been used in cases of CHF with continued results. Tolerance to the effects of nitrates is often a controversial topic, with many older texts stating that one will develop tolerance to both adverse and therapeutic effects with long term use. A current text on pharmacology should be read for an explanation of the use of nitrates and tolerance.

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Dermatophagoides Scheremetewskyi and Feather Pillow Dermatitis — Aylesworth and Baldrige (page 43).

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Letter to the Editor

Dear Editors:

I misattributed the October profile (nitroglycerin). I would appreciate it very much if a correction could be printed with the next profile.

"The October profile on nitroglycerin was incorrectly attributed to George Bailie. The correct author is Allen Vaida, Pharm.D."*

*See page 617.

Bart Galle, Ph.D.
University of Minnesota

Dermatology Page

Dermatophagoides Scheremetewskyi and Feather Pillow Dermatitis

ROBERT AYLESWORTH, M.D. and DAVID BALDRIDGE, M.D.*

THERE ARE over 200 families of mites. Numerous reports of facultative mite infestations associated with pruritus and dermatitis have been noted. We recently encountered a case of an infestation caused by an uncommon mite, *Dermatophagoides scheremetewskyi*.

Case Report

A 21-year-old man presented to the St. Paul Ramsey Dermatology Clinic. He gave a three week history of scalp and forearm pruritus. He brought with him a piece of clear plastic tape which contained several of the creatures he believed were causing the problem.

Physical examination revealed three papular urticarial lesions on the left wrist. Similar papules were scattered in the scalp. Examination of the tape revealed mites, which were identified as *Dermatophagoides scheremetewskyi* Bogdanoff (1865) (Figure).

A search of the patient's home by the authors uncovered three feather pillows containing large numbers of *Dermatophagoides scheremetewskyi*.

After removal of the pillows the pruritus abated, only to return in a few days. We postulated that the mites' primary food source had been eliminated and they were seeking alternative hosts. Spraying the bed and apartment with Raid® proved ineffective. Upon the authors' instructions, he applied a ½% diazinon solution to cracks and corners and a 3% malathion solution to areas of human contact. The dermatitis abated and has not recurred.

Discussion

Dermatophagoides scheremetewskyi is a member of the family Psoroptidae. Psoroptid mites attack warm blooded hosts feeding primarily on debris. In contradistinction to scabies mites, psoroptid mites do not burrow, but cause dermatitis by piercing the skin surface.¹ *Dermatophagoides pteronyssinus*, the house

dust mite, is an etiologic agent in allergic asthma. *Dermatophagoides* species mites can produce dermatitis by either allergic mechanisms¹ or by direct feeding.

Dermatophagoides scheremetewskyi was first described as infesting humans in Russia in 1865. There are only two reports of mite infestation associated with a dermatitis of the scalp and upper trunk.^{3,4} *D. scheremetewskyi* has been found in pillows, a sparrow's nest, monkey food, a bed, and on rats, muskrats, bats, and mice.⁵ The sources of infestation in the current case were feather pillows.

Eradication of this species has proven difficult. A variety of agents including sulfur, DDT, benzyl benzoate, Tween 80, benzocaine, lindane, and Raid® have been ineffective. In the current report, a combination of diazinon and malathion sprayed in the mites' environment resulted in elimination of the mites.

D. scheremetewskyi is an uncommon ectoparasite of man. The current case illustrates the association of a feather pillow mite infestation in a patient with papular urticaria.

Dr. Mark Ascerno, Jr., Ph.D., Insect Pest Control Clinic, University of Minnesota Department of Entomology, Fisheries, and Wildlife identified the mite.



Figure — *Dermatophagoides scheremetewskyi* (× 100)

*Department of Dermatology, University of Minnesota, Box 98, University Hospitals, Minneapolis, Minnesota.

Presented at the parasitology seminar hosted by the Minnesota Dermatological Society at the University of Minnesota, May, 1982, and will appear in expanded form in the Journal Amer Acad Dermatol.

References will be found on page 42.

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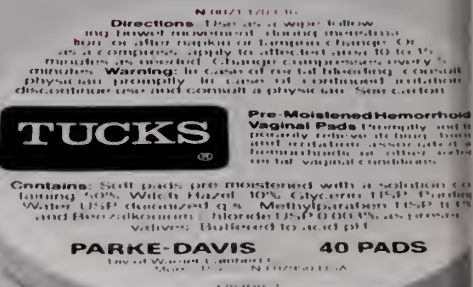
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Please see opposite page for brief summary of prescribing information.

*Meeting of Am Soc Colon/Rectal Surgeons, May 1980
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Each gram of Anusol-HC Cream contains hydrocortisone acetate, 5.0 mg, bismuth subgallate, 22.5 mg, bismuth resorcin compound, 17.5 mg, benzyl benzoate, 12.0 mg, Peruvian balsam, 18.0 mg, zinc oxide, 110.0 mg, also contains the following inactive ingredients: propylene glycol, propylparaben, methylparaben, polysorbate 60 and sorbitan monostearate in a water-miscible base of mineral oil, glyceryl stearate and water.

Anusol-HC Suppositories and Anusol-HC Cream help to relieve pain, itching and discomfort arising from irritated anorectal tissues. These preparations have a soothing, lubricant action on mucous membranes, and the antiinflammatory action of hydrocortisone acetate in Anusol-HC helps to reduce hyperemia and swelling.

The hydrocortisone acetate in Anusol-HC is primarily effective because of its antiinflammatory, antipruritic and vasoconstrictive actions.

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Anusol-HC is especially indicated when inflammation is present. After acute symptoms subside, most patients can be maintained on regular Anusol® Suppositories or Ointment.

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Warnings: The safe use of topical steroids during pregnancy has not been fully established. Therefore, during pregnancy, they should not be used unnecessarily on extensive areas, in large amounts or for prolonged periods of time.

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Clinicopathological Conference

Fever, Hemolysis, Thrombocytopenia and Central Nervous System Symptoms in a 46-Year-Old Man

D. K. OHRT, M.D.*

A 46-YEAR-OLD Caucasian male had sudden onset of low back pain with radiation to the left thigh while driving his car. Persistence of pain caused him to visit his local emergency room the next day. Vital signs and basic laboratory work were within normal limits except for 1+ proteinuria, minimal hematuria, and borderline pyuria. He was given acetaminophen, local heat, and trimethoprim-sulfamethoxazole.

The next day continued back pain resulted in hospitalization. He was placed in traction. Initial laboratory data included normal BUN, creatinine, bilirubin, total protein, SGOT, LDH, hemoglobin, and an 11,500/mm³ white blood cell count. Traction provided no relief. He gradually became lethargic over the following three days with temperature elevation to 101.6° F. The blood pressure gradually increased with diastolic pressures between 90-120 mm/Hg and systolic pressures between 150-200 mm/Hg. Additional laboratory data included: white blood cell count 13,900/mm³, total bilirubin 3.6 mg/dl, SGOT 70 U/l, SGPT 62 U/l, GGTP 50 U/l (normal 20-40 U/l), and mild LDH elevation. On day five of his hospitalization his creatinine was 4 mg/dl.

Past Medical History

He had childhood asthma. He was taking propranolol and a thiazide diuretic for essential hypertension detected eight months prior to this admission. He claimed allergy to both aspirin and penicillin.

Family History

His father died of myocardial infarction at age 50. His mother was alive at 83 with diabetes mellitus and an old cerebrovascular accident.

Admission to Immanuel-St. Joseph's Hospital

Progressive lethargy prompted his transfer to Immanuel-St. Joseph's Hospital. Review of the history disclosed no significant information concerning the onset of his illness. The pain was now in the lower, anterior abdominal region and had become diffuse.

Physical Examination

Initial physical examination revealed blood pressure

140/98 mm/Hg, pulse 100/min., respiratory rate 24/min., and temperature 99° F. He was somnolent but responded to questions appropriately. The pupils were round, regular, equal, and reactive to light. There was a slight diversion strabismus. Disc margins were sharp. The mouth and neck were normal. The chest was clear to auscultation and percussion with a grade I/VI systolic murmur heard only at the apex. The cardiac rhythm was regular. The abdomen was mildly distended and tympanitic with decreased bowel sounds especially in the lower quadrants. Minimal tenderness was elicited on deep palpation. The prostate gland was mildly enlarged. Stool was guaiac positive. The extremities and spine were unremarkable. The neurological examination failed to identify any specific abnormalities other than a right-sided Babinski reflex.

Laboratory

At the time of transfer to Immanuel-St. Joseph's Hospital (late on the fifth day of hospitalization), the hemoglobin was 13.3 g/dl, and the white blood cell count was 14,000/mm³ with 51% neutrophils, 31% bands, 8% lymphocytes, and 10% monocytes. The

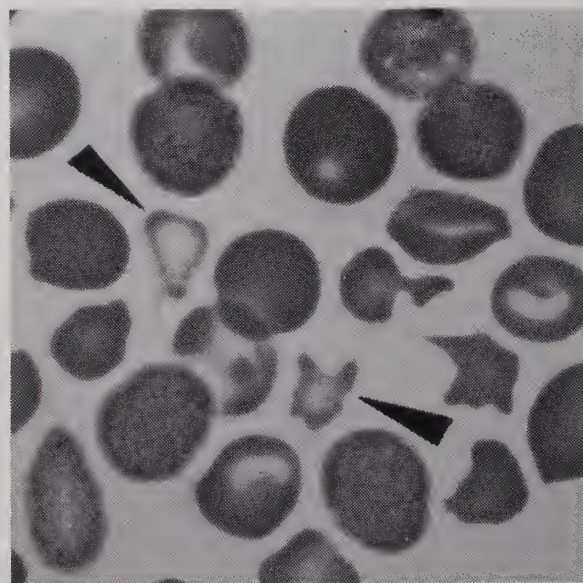


Fig. 1 — Multiple schistocytes in peripheral blood smear of this patient consistent with changes of MAHA. (900 X).

*Pathologist, Immanuel-St. Joseph's Hospital, Mankato, Minnesota.

platelet count was 83,000/mm³ and schistocytes were present on the peripheral smear. The BUN was 81 mg/dl, creatinine 4 mg/dl, serum sodium 133 mEq/l, serum potassium 3.2 mEq/l, prothrombin time 18 seconds, activated partial thromboplastin time 117 seconds, thrombin time 23.2 seconds (normal 14-20 seconds), bilirubin 4.4 mg/dl with 50% direct reacting, and SGOT 183 U/l. Urinalysis revealed a specific gravity of 1.017, pH 5, 2+ albumin, negative ketones, negative bile, 3+ occult blood, 2-5 white blood cells/hpf, 250-300 red blood cells/hpf, and 0-2 coarsely granular casts occasionally containing renal tubular epithelial cells and a few red blood cells/lpf. The urine culture produced less than 10² colonies/ml of a gram-negative rod. The VDRL was positive with negative FTA-ABS. The platelet count dropped to the 30,000-40,000/mm³ range and the hemoglobin was 10.4 gm/dl on the day after transfer. The direct Coombs' test was negative and serum protein electrophoresis unremarkable. Specific immunoglobulin levels demonstrated 81 mg/dl of IgM. Fibrinogen and fibrin degradation products were increased. C-2, C-3, and C-4 levels were normal with absent total hemolytic complement activity (CH-50). Hepatitis B surface antigen and hepatitis B core antibody were negative. Quantitative factor V and VIII levels were within the normal range. Blood cultures obtained prior to initiation of antibiotic therapy produced no growth. Therapeutic intervention included gentamicin and cefazolin adjusted for the degree of azotemia. Intravenous furosemide caused no significant change in urine output. His temperature was initially normal, rose to 102°F several hours after admission and was never below 100.5°F during the remainder of his hospitalization. Approximately eight hours after admission the patient was noted to be hypertensive with a blood pressure of 200/120 mm/Hg. Fundoscopy suggested arterial spasm. He was given 300 mg. of diazoxide intravenously and the blood pressure returned to 140/100 mm/Hg. An ultrasound examination of the abdomen reported normal renal internal architecture and outlines with no evidence of extra-renal pathology. The general condition of the patient continued to slowly deteriorate. A working diagnosis was established and the patient transferred for specific therapy late on the sixth day of hospitalization.

Case Discussion

Dr. James V. Donadio*: I think this case is going to

resolve into one that is very unusual. The associations that I will make are usual and have been mentioned frequently but are only infrequently documented. First, however, were there any significant radiologic studies performed?

Radiographic Findings

Dr. LeRoy Olson†: A PA and lateral view of the chest and flat plate of the abdomen were performed. The PA projection of the chest is unremarkable. However, the lateral projection demonstrates a short streak of pleural effusion in the major fissure. There is also fluid accumulation in the minor fissure on the right. The differential diagnosis of minimal pleural effusion is long and includes hypoproteinemia, cardiac failure, Coxsackie B virus infection, etc. Considerable clinical and laboratory information would be needed to narrow our list. I want to point out the importance of the lateral view in the evaluation of this patient since it was the only one that showed any pathology.

Bowel distension but no real evidence of obstruction is observed on the flat plate of the abdomen. Again, our differential diagnosis is just a long list without pertinent clinical data.

Summary of Pertinent Clinical and Laboratory Observations

Dr. Donadio: Our patient is a middle-aged man who had a short illness consisting of back pain, lethargy, low-grade fever, and a marked thrombocytopenia. The latter is the hallmark of this case. He was transferred to your hospital with somnolence, mild hypertension, minimal fever, abdominal signs suggesting an ileus, question of a right-sided Babinski reflex, and no mention of rash or purpura but evidence of mucosal bleeding with guaiac-positive stool. The hemoglobin value on admission was minimally decreased but dropped dramatically over a short period of time without evidence of blood loss. There was a leukocytosis with left shift suggesting the possibility of bacterial infection, and lymphocytopenia, thrombocytopenia, and schistocytes in the peripheral blood smear. Cultures were negative prior to antibiotic therapy in your hospital. The urinary sediment was active. Hemolytic complement activity was absent with normal C-2, C-3, and C-4 levels. The VDRL was positive, and there was a lupus-like anticoagulant. The fibrinogen was increased with increased FDP. Immunoglobulin levels were within normal limits. The activated partial thromboplastin time was markedly prolonged with only modest increase in the thrombin time and prothrombin time. There was significant

*Chairman, Division of Nephrology, Department of Internal Medicine, Mayo Clinic.

†Staff Radiologist, Immanuel-St. Joseph's Hospital, Mankato.

indirect hyperbilirubinemia and elevated liver enzymes. He was in renal failure. The urine culture produced less than 100 colonies of bacteria/ml. On arrival he was given parenteral gentamicin and cefazolin to cover the possibility of gram-negative bacteremia. He developed acute hypertension. The kidneys were normal by ultrasound. His clinical course then became characterized by confusion and somnolence.

Differential Diagnosis

In the broad sense this patient developed features of disseminated intravascular coagulation (DIC). This is a complex series of changes in the blood coagulation and fibrinolytic systems which are secondary to a wide variety of clinical situations which in turn lead to consumption of clotting factors and platelets. This results in small blood vessel obstruction by fibrin and platelets with tissue necrosis resulting in single or multiple organ damage and abnormal bleeding. The clinical conditions associated with DIC number over 50. Obstetrical patients account for 50% of total cases with another 30% secondary to malignancy. The first would not be considered in a 46 year old male and the second can be ruled out by the clinical information. Many types of infection can trigger DIC. All can be ruled out except meningitis or septicemia. He had normal C-2, C-3, and C-4 fractions but absent hemolytic complement activity. Disseminated infections caused by members of the genus *Neisseria* (i.e., the gonococcus and meningococcus) have been associated with terminal complement component deficiencies involving C-5, C-6, C-7, and C-8. The membranolytic complex which involves C-5 to C-8 resulting in bacterial lysis has a critical role in host defense of these bacteria. The situation suggested urinary tract infection with bacteremia to his clinicians and it might also suggest meningitis although meningeal signs were not apparent. Was a spinal fluid examination performed?

Dr. Gregory Rutecki*: We did not feel the clinical findings warranted a spinal fluid examination.

Dr. Donadio: DIC could have been caused by an *E. coli* bacteremia with negative cultures due to the previous antibiotic treatment. The previously mentioned complement deficiencies are not nearly as important in defense against the gram-negative rods.

I would like to move on to the remaining grocery list of causes of DIC and pick three significant possibilities for in-depth evaluation: hemolytic-uremic syndrome (HUS), thrombotic thrombocytopenic purpura (TTP), and systemic lupus erythematosus (SLE).

*Nephrologist, Mankato.

Pathophysiology and Pathology: HUS and TTP

HUS is characterized by acute renal failure that varies in its severity, a microangiopathic hemolytic anemia (MAHA) with schistocytes, and an anemia that either may not be very significant or not present at all early in the disease. Platelets and fibrin thrombi occlude glomerular capillaries, renal arterioles, and small interlobular arteries. There is endothelial cell swelling and proliferation which may lead to ischemia with arteriolar, glomerular, and in some cases renal cortical necrosis. Fibrin thrombi may be sparse at this stage presumably because fibrinolysis is taking place and the fibrin has been disrupted, altered, and removed. Immunofluorescence microscopy of occluded vessels demonstrates fibrin-related antigen and, infrequently, IgM and C-3.

The vascular lesions of HUS are usually limited to the kidneys. However, with TTP multiple organs are characteristically involved and postmortem examination demonstrates the characteristic intravascular lesions in heart, brain, kidney, pancreas, and adrenal gland. The presence of intravascular thrombi forces us to speculate that HUS is a localized form of DIC. Several differences between these disorders strongly suggest they may not be related at all. The characteristic laboratory findings of DIC include thrombocytopenia, hypofibrinogenemia with reduced clotting factors, and increased FDP. This patient had elevated fibrinogen, normal factor V and factor VIII activity, and elevation of fibrin degradation products presumably secondary to intravascular activation of the clotting system by release of thromboplastin into the circulation as observed in obstetrical complications or certain tumors such as giant hemangiomas. In DIC, heparin, but not inhibitors of platelet function such as dipyridamole, aspirin, and sulfinpyrazone returns the serum fibrinogen level and the platelet count to normal. In HUS there is very rapid platelet consumption and not primary activation of the coagulation pathway. These thrombi contain abundant platelets and only a thin rim of fibrin. There is increased platelet turnover but not excessive fibrinogen turnover in kinetic studies. Therefore, thrombocytopenia is present but thrombin, prothrombin, and partial thromboplastin times are usually normal. The prolonged clotting studies in this patient, particularly the partial thromboplastin time, were due to the lupus-like anticoagulant which will be discussed later. Platelet consumption is the primary event. Elevated levels of fibrin degradation products may be present in HUS, presumably due to the effect of the fibrinolytic system

on the fibrin laid down during the platelet degradation process. Another important difference between these disorders is that renal failure is characteristic of HUS but is unusual in DIC unless the DIC is secondary to shock or septicemia.

There are two theories concerning platelet consumption in HUS. First, vascular injury could be caused by viruses, an antitoxin, or immune complexes disrupting the endothelium. The second theory concerns the absence or deficiency of an antiplatelet aggregation factor. The major evidence supporting the latter theory has come from a study of patients with TTP. Dramatic reversal of symptoms followed infusion of normal plasma in some patients which suggested that an inherent deficiency had been corrected. Plasma from three patients with TTP induced in vitro platelet aggregation of washed normal platelets. This effect was reduced by the addition of normal plasma. The deficient factor, which may be a high molecular weight protein, has not been identified. It has been suggested that sepsis might act by activating prostacycline (PGI₂) or prompting its production in the vessel wall.¹ PGI₂ is an important antiaggregating factor and opposes the action of thromboxane, which is produced in platelets and is an important proaggregator of platelets. It is thought that there is a balance between these two prostaglandins that keeps platelets "slippery" or, under the appropriate pathophysiological circumstances, allows aggregation to occur. Remission in TTP can occasionally be induced by plasma exchange.² Some of the early successes with this treatment suggest that plasma removal was eliminating an excess factor and not treating a factor deficiency. TTP may represent a spectrum of diseases in which lack of inhibitor or excess activator may be responsible for the excessive platelet aggregation.

Pertinent Clinical Features of HUS, TTP, and SLE

Childhood HUS primarily affects children under four years of age. It usually follows an upper respiratory or gastrointestinal tract infection as thrombocytopenia, MAHA, and uremia. Adult HUS may also follow a non-specific or clinically insignificant infection but more commonly is seen in women who are postpartum or taking oral contraceptive agents.³ The majority of adults have no premonitory illness at all. Some have had essential hypertension and suddenly developed symptoms of acute renal failure, MAHA, and thrombocytopenia. Fever, neurologic symptoms, and cardiomyopathy are uncommonly observed.

TTP is characterized by a pentad of findings: fever,

MAHA, thrombocytopenia, renal failure with proteinuria, hematuria, and increased serum creatinine and unremitting neurological abnormalities.⁴ The literature states that there is a 3:2 female to male predominance with the disorder usually beginning in the middle years. Most patients have a flu-like syndrome with fever, malaise, nausea, and vomiting which progresses to the full pentad. Thrombi may be found in a variety of organs resulting in a myocardial or intestinal infarction, or in an occasional patient, back pain. Laboratory findings of TTP include: anemia, schistocytes on peripheral blood smear, elevated bilirubin, increased LDH, decreased serum haptoglobin, and a negative direct Coombs' test. Acute oliguric renal failure may be the presenting symptom. Hypocomplementemia may be found but appears to reflect activation by viral products or proteolytic enzymes rather than increased utilization in the formation of immune complexes. There is often a decrease of C-3 due to alternate pathway activation. In this case I do not believe the decrease in hemolytic complement is due to either activation of the classic or alternate pathway since three of the major components of the complement system were within normal limits.

The diagnosis of TTP is strongly suggested by the clinical findings. One should get tissue confirmation which identifies the platelet-fibrin thrombi in arterioles and capillaries. Convenient and safe places to biopsy, such as skin, gingiva, and bone marrow provide a positive diagnosis only 50% of the time. Renal biopsy has been used but would be quite dangerous when the platelet count is 40,000/mm³ or less and would not be recommended in this patient. Many of the confirming tissue diagnoses have been made at autopsy. I must emphasize that the difference between TTP and HUS is made on clinical grounds rather than by pathological findings. In TTP the neurological symptoms are prominent and renal failure is often relatively mild. In adult HUS renal failure may be the only serious abnormality.

The occurrence of TTP and SLE has been previously reported. In the large series by Amorosi and Ultmann, 11 of 271 cases had LE cell preps which were positive and 13 additional patients had clinical findings strongly suggestive of SLE.⁵ Usually TTP develops during the course of previously diagnosed SLE. This combination, I must emphasize, is rare.

Our patient today had clinical symptoms that best fit TTP. However, there are serological abnormalities which suggest the collagen disease SLE. Let's review the data. The absent hemolytic complement activity indicates either a congenital or acquired defect of one or more components. Excessive consumption is

unlikely since C-2, C-3, and C-4 levels were within normal limits. A congenital deficiency of complement components is frequently observed in patients with rheumatic diseases, and this is true for SLE and discoid lupus. The prolonged partial thromboplastin time identifies a lupus-like anticoagulant which is active against any phospholipid.⁶ This was also responsible for the modest increase in prothrombin time and thrombin time where it interferes with the prothrombin activating complex which includes a whole host of phospholipids. A false-positive VDRL is present in 25% of patients with SLE, generally in conjunction with a lupus-like anticoagulant, since the VDRL test system utilizes a phospholipid antigen.

The lupus-like anticoagulant is clinically insignificant because bleeding and clotting times are normal and it disappears with steroid therapy. This is not true if there is a specific antibody directed against factors II, VIII, IX or X. Such an antibody can also develop in patients with SLE who then develop a bleeding diathesis. Again, steroid therapy reverses the activity of the antibody. Was a FANA performed?

Dr. Rutecki: Yes, it was negative.

Dr. Donadio: How about anti-DNA?

Dr. Rutecki: This test was not performed.

Dr. Donadio: With complement deficiencies the antinuclear antibodies may not be positive. Were the other complement components measured?

Dr. Rutecki: No.

Dr. Donadio: I think this patient had a clinical syndrome most compatible with thrombotic thrombocytopenic purpura. The trigger may have been an *E. coli* septicemia but was more likely related to SLE. This combination is unusual since the clinical findings of SLE were not present at the time he developed the symptoms of TTP. I would like to postulate that the SLE is associated with one of the complement component deficiencies, possibly C-1. If you biopsied the kidney after the platelet level had stabilized, I suspect you found platelet and fibrin thrombi. Also, if my impression is correct, he had a proliferative glomerulonephritis accounting for the active urine sediment.

Dr. Donadio's diagnosis: Thrombotic thrombocytopenic purpura with underlying systemic lupus erythematosus associated with a complement component deficiency.

Dr. Ohrt: Schistocytes, (Figure 1) the characteristic finding of MAHA, were present in the peripheral blood.⁷ These small deformed erythrocytes are an important observation but can be seen with other conditions including certain infections and vas-

culitides, burns, heart valve prostheses, and march hemoglobinuria.

The clinical and laboratory observations in his two day stay at Immanuel-St. Joseph's Hospital resulted in a working diagnosis of thrombotic thrombocytopenic purpura. He was then transferred for plasmapheresis which is the treatment currently thought to offer the best chance to alter the generally dismal outlook for patients with this disorder. His condition eventually stabilized to the point where a renal biopsy could be performed. Dr. Richard Sibley* shared this material with us.

The typical platelet-fibrin thrombi of TTP were identified in glomeruli (Figure 2). These deposits characteristically lie in the afferent arteriole and small arteries and are accompanied by subintimal fibrin deposits and, eventually, intimal hyperplasia. This process as explained by Dr. Donadio is taking place in all major organ systems. The pathologic changes do not adequately distinguish between TTP and HUS⁸.

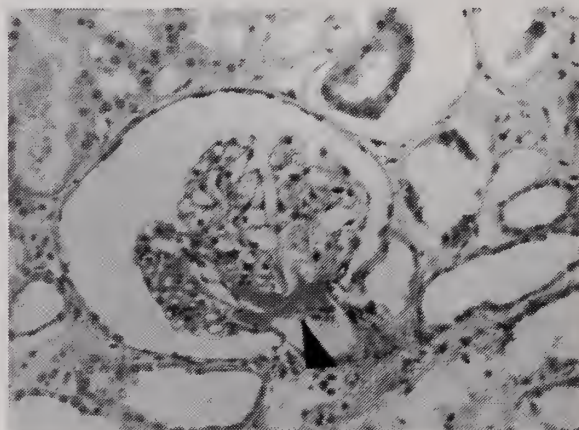


Fig. 2 — Renal glomerulus with typical platelet-fibrin thrombus in afferent arteriole (at arrow). (225 X).

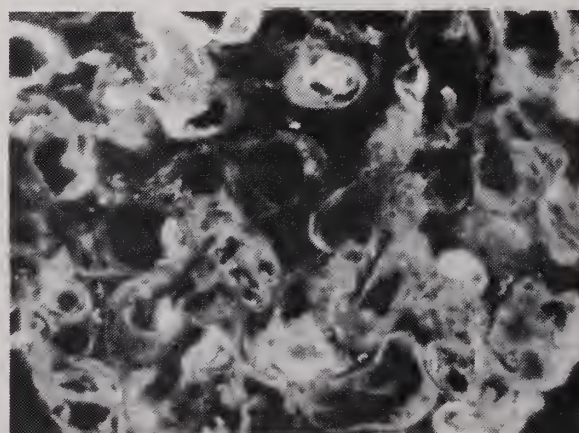


Fig. 3 — Frozen section of renal glomerulus stained with antifibrinogen antibody demonstrates significant fibrinogen within the lumen and walls of glomerular capillaries. (approximately 450 X).

*Department of Laboratory Medicine and Pathology, University of Minnesota.

Fluorescent antibody technique identified abundant fibrin (Figure 3) and C-3 with lesser amounts of IgG and IgM.

There was also evidence of proliferative glomerulonephritis which could have been secondary to SLE as postulated by Dr. Donadio. I would like to ask Dr. Rutecki to give us additional follow-up on this patient.

Dr. Gregory Rutecki: Plasmaspheresis significantly improved the clinical and laboratory abnormalities. Prednisone was also instituted at that time. Neurological symptoms returned after several months in the form of drop attacks at work with total loss of consciousness. Infusions of fresh frozen plasma were begun and were associated with improvement in the clinical symptoms for about 30 days. Our consultant in

neurology felt the central nervous system symptoms were secondary to vertebral-basilar platelet emboli. Dipyridamole was then added with minimal clinical benefit. The last unit of fresh frozen plasma we were able to give him resulted in a near-fatal anaphylactic reaction. Cyclophosphamide was then added to the treatment regimen and promptly caused a hemorrhagic cystitis. For the last three months he has been maintained on azathioprine with gradual tapering of the prednisone from 60 mg/d to 5 mg/d. There is a great deal of evidence that the underlying problem is indeed a vasculitis and is consistent with SLE.

Final clinical diagnosis: Thrombotic thrombocytopenic purpura, secondary to vasculitis consistent with systemic lupus erythematosus.

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Child Psychiatry in an HMO

A Critical Review

JOHN D. MICHELMAN, M.D.*

The author reviews child psychiatry practice in an HMO and attempts to assess the strengths and weakness of this type of mental health coverage. Since HMO treatment of the chronic mentally ill has been a major issue in this journal;[†] special attention is given to the treatment of chronic HMO child psychiatry patients. Thirty day maximum hospitalization benefit for schizophrenics and affective disorder cases is assessed. The effects of apriori treatment restrictions on the HMO child psychiatrist's professional identity are discussed.

THE AUTHOR FEELS that his HMO child and adolescent mental health section receives new referrals which accurately reflect the population's initial needs. HMOs do particularly well with those outpatients who are able to focus on specific psychotherapy goals. In contrast, more chronic or chaotic patients and their families present problems which are not fully served in the current HMO plan. Three distinct groups of chronic patients are of concern: hospitalized cases of schizophrenia and major affective (mood) disorder; and severe conduct (behavior) disorder patients. Current HMO psychiatric hospitalization restrictions (30 days/year) are arbitrary and often insufficient. Many schizophrenic and affective disorder patients are prematurely discharged before well established medication and milieu treatments have had sufficient time to work. State and county institutions pick up care after inadequate HMO hospital coverage is exhausted. The author therefore advocates extended inpatient and day hospital programs to schizophrenic and affective disorder patients.

Although conduct disorder cases are also underserved, it is doubtful that they benefit from current brief child psychiatry programs. The author feels that final diagnosis conduct disorder cases are inappropriate for extended mental hospital stays.

Patients and Methods

Group Health Plan, Inc., HMO has recently granted limited child/adolescent/and family mental health benefits to all members under 16 years old. Individual policies vary but most current benefits include 20

individual/or family visits per year (10 dollar/session co-payment); 40 group therapy sessions per year (five dollar/session co-payment); and 30 days/year maximum inpatient or day hospital program (most policies have no inpatient or day hospital co-payment).

Table 1 presents clinical diagnosis of 200 consecutive outpatients seen from March, 1980 through December, 1981. Diagnosis follows D.S.M. III criteria and is essentially descriptive and symptom based, rather than etiological; since the cause and/or biological markers for these syndromes remain obscure. Substance abuse patients are excluded in this study since they are treated in a separate HMO chemical dependency department. HMO pediatricians refer cases after a full physical work up. The author receives about 15% of the random new outpatients

TABLE 1

Main Clinical Diagnoses † of 200 Consecutive Outpatients Seen By An HMO Child Psychiatrist March, 1980 Through December, 1981. ‡

Insufficient information for Dx.	39
Conduct Disorder	31
No Mental Disorder-	
Parent-Child Problem	16
Anxiety Disorder	16
Adjustment Disorder	16
Somatoform Disorder	
(Pediatric Liaison)	15
Affective Disorder	
(Depression)	13
Oppositional Disorder	11
Attention Deficit	11
Specific Developmental	
Disorder (Learning Disability)	10
Schizophrenia	4
Atypical Psychosis	4
Child Abuse	5

*Director, Child and Adolescent Section Mental Health Department, Group Health Plan, Inc., and Clinical Assistant Professor, University of Minnesota, Child Psychiatry.

†Lee Beecher, M.D., September, 1981; Richard Anderson, M.D. et. al. January, 1982; R. Jerome Rauch, M.D., March, 1982.

‡D.S.M. III Criteria.

§Substance Use Disorders are excluded.

from a general plan population of 50,000 children 16 years and younger. Five other full time therapists also work with this population: two Ph.D. psychologists and three psychiatric social workers.

Table 2 describes eighteen psychiatric hospitalizations during 1981.

Less than 3% of all new child and adolescent patients are hospitalized. Hospitalization is restricted to psychotic, suicidal, or assaultive patients who have not benefitted from outpatient treatment. Severe diagnostic dilemma cases may also be occasionally admitted. All hospitalized cases receive full psychological and academic testing, physical exams, appropriate laboratory tests, and outside consultations as necessary.

Finally, Table 3 presents diagnostic and disposition information on a group of 31 conduct disorder (behavior problem) adolescent patients. Antisocial behavior alone is insufficient for this descriptive diagnosis. Such patients have severe behavior problems and additional broad areas of poor functioning in school, family, or social life. Often these are chronic patients with poor prognosis. Yet they are the HMO child and adolescent section's most common referral.

Results

Main Diagnoses (Table 1)

Children and adolescents do not usually seek mental health care. Most referrals follow school complaints or intolerable family interactions. Within the HMO, primary screening depends on the pediatrician's interest in psycho-social information and his/her feeling that a mental health referral will be productive.

Nor do youngsters stay in treatment without very active parental support. Despite many available programs (groups for each age range seven to 16 years old, individual or family session, day hospital and psychiatric inpatient stays) about 20% (Table 1) drop out after the first session. The most common diagnosis is conduct disorder (see discussion below). Parent — child problems: without clear mental disorder in the youngster also are frequent. Family therapy is the most appropriate treatment for parent — child problems. Many studies show the efficacy of this approach.² But success depends on skilled therapists and a psychological willingness of family members to bear with the initial increased anxiety psychological insight and confrontation product.

Anxiety and adjustment disorders are treated by a variety of methods. Most adjustment disorders in our series follow parental divorce. Again studies show even brief therapy ameliorates post divorce problems,³

although persistent depression and behavior problems⁴ may follow more severe cases. There is an increasing literature regarding short-term therapy with children.^{5,6,7} Of particular interest for the HMO child psychiatrist is a type of goal oriented therapy based on developmental level and repeated (if necessary) at periodic intervals.⁸

Somatoform and pediatric liaison cases need pediatric support. Patients resist the rejection implied when told "It's all in your head", or labeled "hysterical". Good mental health liaison often decreases general medical services⁹ although extreme passive-aggressive defenses (eg. non compliant juvenile diabetes) or persistent depression may be hard to overcome.

Oppositional disorders of childhood present repeated power struggles and opposition; even when the child is offered opportunities for his/her own good. In addition to our own HMO programs, we offer discounts for community classes in parenting techniques. These cases provide preventive therapy. They involve younger children, more responsive to parental approach, and are an early intervention against adolescent conduct disorders.

Attention deficit disorder, schizophrenia, and depression more closely fit a medical model than diagnoses cited earlier. Attention deficit disorder cases deserve a medication trial because repeated studies have shown the therapeutic value of medication (stimulants¹⁰ or antidepressants¹¹) plus a combined school, family and therapy approach. Schizophrenia and depression are discussed below.

Hospitalized Cases (Table 2)

The daily ward treatment of our HMO patients does not differ from other adolescent inpatient programs. However questions arise. Does our low hospitalization rate of 3% adolescents (and no children) reflect too stringent an admission policy? Is the current 30 day hospitalization limit sufficient for differential diagnosis and continuum of care?

An evaluation of hospitalized versus outpatient major depressive disorders helps assess hospital admissions policy. Table 2 lists seven hospitalized depression cases. All hospitalized patients were admitted after suicide attempts. Despite rather chronic histories, only two patients were in outpatient therapy prior to their attempted suicides. Table 1 follows 13 quite similar depressed outpatients. Ten of these patients also had suicide attempts requiring pediatric or ICU hospitalization. However, we were able to avoid psychiatric hospitalizations in 11 of these cases. The suicidal outpatients who were not admitted had an

ongoing therapeutic transference to their therapist. They trusted the therapist and were able to rely on an inner feeling of future therapeutic help. In contrast to the hospitalized patients, these suicidal outpatients were neither absolutely pessimistic nor isolated. They could "contract" with the therapist to call for help before another suicide attempt. No successful suicides occurred in either our outpatient nor inpatient group.

Evidently, both severity of depression and lack of support systems (particularly lack of outpatient therapy) lead towards hospitalization. Good participation in outpatient programs is often cited in studies¹² of

successful psychiatric deinstitutionalization.

A look at termination status is necessary to answer questions regarding the 30 day maximum hospitalization policy. Three schizophrenic patients are listed in Table 2. By coincidence they all had 70 day inpatient benefits when first hospitalized. In no case was an initial 30 day hospitalization sufficient. Initial differential diagnosis and medication trials were incomplete at one month. Yet many studies^{13,14} show the efficacy of medication plus therapy for young schizophrenics. Properly diagnosed and medicated schizophrenics are able to live independently for greater intervals between

TABLE 2
Eighteen Psychiatric Hospitalizations In 1981
HMO Coverage (Days)

Diagnosis	Hospital	Day Hospital	Residential	Post-HMO Out-of-Home Placement For > 1 Month
Schizophrenia (14 y/o male)	20+	30		no
Schizophrenia (17 y/o female)	58			State Mental Hospital
Schizophrenia (15 y/o female)	26*			no
Acute Psychotic Break ? Dx. (16 y/o male)	10			no
Paranoid Disorder, Transvestite (17 y/o male)	58			Group Home
Major Depressive and Conduct Disorders (15 y/o female)	5		25	Residential
Major Depressive (15 y/o male)	8			Juvenile Detention
Major Depressive (13 y/o boy)	4		26	Residential
Major Depressive (15 y/o female)	3			no
Major Depressive (17 y/o female)	20			Group Home
Major Depressive (15 y/o female)	18			no
Major Depressive (15 y/o female)	6			Foster Home
Attention Deficit with Hyperactivity (14 y/o male)	21		9	Residential
Conduct Disorder (13 y/o female)	21			Residential
Conduct Disorder (15 y/o female)	21		49	Residential
Borderline Personality Disorder (16 y/o female)	11			no
Incest Victim (15 y/o female)	30			Residential
Incest Victim; Conduct Disorder (15 y/o female)	16			Residential, then juvenile detention
Total % of patients with post-HMO placement = 12/18 = 66.6%.				

¹Previous year hospitalization of 35 days.

*Previous year hospitalization of 54 days.

hospitalization. For example, we needed 54 days in 1980 to treat a catatonic schizophrenic with anti-psychotics (Haldol then Navane) and established helpful special schooling and outpatient therapy plans. Outpatient work showed the additional value of concurrent Lithium. Change of residence to live with relatives also occurred. When the patient's second psychotic break came about one year later, we were able to release her in 26 days. These are complicated cases and need a careful first evaluation.

Thirty days is also inadequate for many affective disorder patients. True, some depressed patients (usually Borderline Personalities or others with strongly ambivalent dependency needs) are risks for endless institutionalization. Yet others do benefit, but need more time. Current antidepressant medications may take a month for maximum effect and often a number of antidepressants need empirical trials.

Table 2 presents details on eighteen HMO child psychiatry hospitalizations. The column at far right "post-HMO out-of-home placement" should be emphasized. Two thirds of our 1981 hospitalizations were picked up by out-of-home community funded placements. Although financial burden on the community is the most obvious "dumping cost", other problems add up. Non hospital placements may not be able to continue medication management, e.g. extrapyramidal side effects from antipsychotics. The HMO physician — patient relationship is usually lost or greatly diluted. Since each new placement does its own evaluation, much diagnostic work is needlessly repeated. Psychiatric patients commonly regress at the time of transfer.

When a medical treatment plan is insufficient for over half of its patients, a thorough reassessment must be made. While awaiting clearer biological markers and medication treatment for these classic child psychiatric patients, I recommend immediate expansion of their inadequate in-hospital benefits. Although some chronic cases will always be referred to state hospitals, etc., a post-HMO referral for 66.6% of these cases is too high.

Conduct Disorder Cases (Table 3)

This descriptive diagnosis implies repetitive antisocial behavior with severe behavioral problems at school. Distinction is made between aggressive and unaggressive types.¹⁵ Socialized subtypes have loyalty to peer group and evidence of empathy. Less frequent unsocialized conduct disorder patients have more disturbed MMPIs and poorer prognosis.¹⁶

Differential diagnosis¹⁷ of conduct disorders includes substance abuse, affective disorders, paranoid

disorders, psychosis, and epilepsy. Often, there is concurrent diagnosis of attention deficit¹⁸, learning disability, and family dysfunction.^{19,20} Table 3 presents the referring and final diagnosis of thirty cases. Our boys' sample includes 20% psychotic symptoms or C.N.S. signs. This is close to 33% psychotic symptoms or C.N.S. signs that Lewis found in her study of 150 court referred delinquents.²¹

A more general discussion of these cases is in preparation.²² Suffice it to note that conduct disorder patients are: (1) our most common referral (2) our highest "drop out" (3) very resistant to therapy (4) often chronic cases with poor prognosis.

After a thorough differential diagnosis, we usually recommend voluntary outpatient programs. Outpatient therapy accepts our inability to physically control conduct disorder patients. Instead, one aims for a more manageable emancipation; rather than a return to some (usually fantasized only) regimented family system.

Most HMO patients do not accept this approach. Parents usually want to place physical restraint on their conduct disorder adolescents. They may appeal to juvenile court to place their children in out-of-home programs as status offenders (children committing acts which would be legal for an adult; but are unlawful for a child; eg. truancy, running away, being beyond the control of one's parents). In fact, HMO parents did arrange some out-of-home placement for over 70% of such cases. The HMO only hospitalized 21% (combined boys and girls sample). The remainder were placed by court or community agencies.

Discussion and Recommendations

Financial Considerations

The cost of our present programs represents about 70 cents per HMO member/month. A number of factors keep this figure low. Limited hospitalization (approx. 12/day/year per 1000 pediatric age patients) is most important. Early intervention, multiprogram care is also essential. For example, when an alcoholic parent is seen in our Chem/Dep Department, it lowers the chance that the child will need child psychiatric care. The use of supervised non M.D. psychotherapists, and limited outpatient visits also reduces cost.

With almost 10 percent of the American gross national product spent on health care in 1981; and Minnesota's own Chem/Dep-Mental Health costs rapidly rising (Blue Cross/Shield payment for these services increased 115% over the past five years compared to a 58% rise in overall hospital charge index)²⁶, plans for cost reduction demand serious consideration. Yet physicians must balance cost reduction against standard of care, continuum of care,

and professional identity issues.

Standard of Care

Positive aspects of our HMO child and adolescent and family outpatient care standards include excellent physical examinations by referring pediatricians, multiprogram psychotherapies, frequent therapist peer review, and an increasing expertise among therapists in focused, goal oriented psychotherapy. Although most outpatients are not seen by the child psychiatrist, supervised differential diagnosis (as in Tables 1 and 2) is available and there is easy referral to the child psychiatrists' medication trials: antipsychotics, antidepressants, stimulants (for attention deficit), and occasional antianxiety agents.

Most outpatient families participate well and our results are consistent with the general psychotherapy efficacy studies already presented.

Conduct disorder cases (Table 3) are a notable exception. Until recently, it has been a private practice child psychiatry community standard to have frequent diagnostic and therapeutic hospital admission for these behavior disorder adolescents. In contrast, we feel we can often accomplish a full differential diagnosis on an outpatient basis. The prognosis for these cases is bleak. Longitudinal studies^{23,24} show a high incidence of rearrest, incarceration, divorce, substance abuse and continued antisocial behavior. Although long term residential/work programs may be productive, studies to indicate brief psychiatric treatment benefit in this group are lacking. Until biological markers or genetic studies more clearly demonstrate a medical etiology or treatment of conduct disorders, our HMO will continue to carefully limit involvement.

Continuum of Care

Positive aspects of our HMO plan include its refusal to follow the dubious example of certain federal and out-of-state HMOs which exclude "chronic" and/or "non-compliant" mentally ill. Exclusion of schizophrenics and affective disorder cases neglects many recent therapeutic advances and may encourage tacitly approved medical abandonment by the physicians involved. Nor do we exclude new HMO members with pre-existing illnesses, as is commonly done by many private insurance companies. HMOs do have preventative programs and seek early identification of mental disorders.

The major weakness in our HMO standards for continuum of care is, however, the arbitrarily brief 30 day/year maximum for hospital and/or day hospital programs. Table 2 notes 67% of our 1981 inpatients with premature hospital discharge. I recommend that hospitalization maximums be extended to sixty days and that less expensive day hospital programs²⁵ be available in some increased ratio (eg. 2/1 or 3/1 per 1 inpatient day).

Professional Identity

The author takes pride in excellent outpatient programs, maximum efforts at patient responsibility, and cost efficiency. It is more difficult to accept that a physician must ration out medical care, especially proven medical treatments in the area of his or her subspecialty. To feel the impact of apriori restrictions of twenty outpatient/thirty inpatient days per year, other physicians might make analogies to their own fields.

TABLE 3

Initial And Final Diagnosis Of 31 Conduct Disorder Cases

<u>Initial Diagnosis †</u>	<u>Final Diagnosis</u>
	6 HMO Drop Out Prior to Dx.
	4 Conduct Disorder
	4 No Mental Disorder: Parent-Child Problem (two with learning disability)
20 Conduct Disorder Boys	2 Schizophrenics
	1 Klinefelter's Syndrome
	1 Major Depressive
	1 Temporal Lobe Seizure and Paranoid Disorder
	1 Substance Abuse

<u>Initial Diagnosis †</u>	<u>Final Diagnosis</u>
	4 HMO Drop Out Prior to Dx.
	3 Conduct Disorder
11 Conduct Disorder Girls	2 No Mental Disorder: Parent-Child Problem
	1 Depressive Disorder
	1 Substance Abuse

†Substance Abuse Cases Are Excluded

Would a pediatrician accept an arbitrary outpatient limit of twenty sessions/year for asthmatic patients? What type of treatment could a pediatric endocrinologist offer juvenile diabetics with maximum thirty days hospital/year?

Other HMO physicians do *not* have arbitrary limits set *before* treatment. Only psychiatrists have such clear restraint. The author notes lack of equity with other physicians. There is also danger of becoming complacent with arbitrary treatment limitations. Physicians should retain their identity as clinical scientists, constantly re-evaluating their treatments. We are wary of seeing ourselves as primary administrators or bureaucrats.

Medical vs. Political/Financial Decisions

The present practice of child psychiatry is increasingly shaped by non M.D. financial and political considerations. Arbitrary HMO standards are not an isolated concern. Third party reimbursement changes, legislation regarding commitment proceedings, and legal restraint on medication trials are of equal impact.

It is crucial that physicians attempt to distinguish medical from political decisions. This review of HMO child psychiatry recommends that a "medical line" be more clearly drawn around traditional psychiatric schizophrenic and affective disorder hospital inpatients and those outpatients with clear biological markers and/or demonstrated therapeutic response. Physicians should take back medical decisions which have been eroded in this area. Current 30 days hospitalizations should be expanded and additional Day Hospital Programs need to be available.

While the quality of life, in general, might well be enhanced by broad programs for all potential patients, financial considerations and child psychiatry's own current therapeutic limitations probably make this only an idea. Some administrative rationing of child psychiatric HMO benefits is therefore acceptable. But such limitations should be in constant re-evaluation. Financial pressure to limit the cost of services cannot overrule medical standards or blind one's vision to the plight of more difficult cases.

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Department of Psychiatry

University of Minnesota Hospitals

Minneapolis, Minnesota 55455

Hospice of the Great St. Bernard

WARREN L. KUMP, M.D.*

The modern hospital movement traces its ancestry through the Christian hospices of the early Middle Ages. This was the opinion of Rudolf Virchow, who was an active student of hospital history as well as the father of cellular pathology. The hospices were located outside population centers and functioned as refuges for travelers or asylums for the needy and infirm. Service to travelers was an especially important function in medieval Europe because roads were usually mere unmarked trails, commercial hostelrys were non-existent, and the countryside teemed with robbers and brigands. With the rise of cities and the formation of hospital orders in the Crusades, Virchow noted that hospices acquired an urban setting and began to assume a medical character.

Among the few remaining Christian hospices located in remote areas and dedicated to the relief of travelers, and the most famous is the hospice of the Great St. Bernard in the Swiss Alps. Sited in the midst of magnificent mountain scenery at the summit of the pass of the same name, it has been for centuries a way station on one of the main trails or roads between Italy and Northern Europe. The hospice was founded by Bernhard von Menthon in the eleventh century and constructed of materials gathered from previous epochs, Roman, barbarian and Saracen. It has been enlarged several times in subsequent centuries.

Augustinian monks still man the hospice, offering hospitality, serving as guides, and occasionally searching for lost travelers. Snow drifts sometimes rise as high as sixty feet in winter and can best be traversed by dogs of the famous breed developed at the hospice. The dogs, by the way, have never carried casks of brandy on their rescue missions; although nowadays they may wear them as props while posing for visiting photographers.

*Radiologist, North Memorial Hospital, Minneapolis.

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Hospice of the Great St. Bernard, Switzerland. Great St. Bernard Lake in the foreground straddles the Swiss-Italian border. Courtesy Swiss National Tourist Office.

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February, 1983

3 Neonatal Resuscitation; North Memorial Medical Center; NMMC; CONTACT: Martin Weems, M.D., 3220 Lowry Ave. No., Mpls., MN 55422, 612/588-0616.

6-13 Jamaican Adventure; North Central Medical Conference; CME included; CONTACT: Karen Tourdot, Minnesota Medical Assoc., 2221 Univ. Ave. SE, Ste. 400, Mpls., MN 55414, 612/378-1875.

9-11 Training in Pulmonary Function Testing/Spirometry; Midwest Center for Occupational Health & Safety; St. Paul-Ramsey Medical Center; CONTACT: Ruth McIntyre, St. Paul-Ramsey Medical Center, 640 Jackson St., St. Paul, MN 55101, 612/221-3992.

10-19 Advanced Cardiac Life Support Course; Methodist Hospital, Methodist Hospital; CONTACT: Joan Peterson, R.N., Methodist Hospital, 6500 Excelsior Blvd., P.O. Box 650, Mpls., MN 55440, 612/932-5419.

11 Quarterly Clinical Meeting; Minnesota Dermatological Society; Hennepin County Medical Center; CONTACT: J. Corwin Vance, M.D., Dept. of Dermatology, HCMC, 701 Park Ave. S., Mpls., MN 55415.

15 Psychiatry; St. Joseph's Hospital; St. Joseph's Hospital, Brainerd; CONTACT: M. A. Muesing, M.D., 303 Kingwood, Brainerd, MN 56401, 218/829-3568.

16-17 Drug Therapy Symposium; U of M Medical School; Location Holiday Inn — Nicollet Mall; CONTACT: CME, U of M, Box 293 Mayo Memorial Bldg., 420 Delaware St. SE, Mpls., MN 55455, 612/373-8012.

19-26 Annual Meeting; Minnesota Psychiatric Society; Colorado; CONTACT: Joseph Westermeyer, M.D., Box 393, Mayo Bldg., U of M Hospitals, Mpls., MN 55455.

25-26 ENT Problems/Primary Care; U of M Medical School; Location Sheraton Ritz — Minneapolis; CONTACT: CME, U of M, Box 293 Mayo Memorial Bldg., 420 Delaware St. SE, Mpls., MN 55455, 612-373-8012.

25-26 Interdisciplinary Approach to Treatment of the Critically Ill Patient; St. Paul-Ramsey Medical Center; Radisson Plaza Hotel, St. Paul; CONTACT: Ruth McIntyre, CME, St. Paul-Ramsey Medical Center, 640 Jackson St., St. Paul, MN 55101, 612/221-3992.

25-26 Office Management in Ear, Nose & Throat; U of M; Mpls.; CONTACT: CME, U of M, Box 293 Mayo Memorial Bldg., 420 Delaware St. SE, Mpls., MN 55455, 612/373-8012.

28-March 1 Basic Life Support Course; Methodist Hospital; Methodist Hospital; CONTACT: Janell Haugen, Methodist Hospital, 6500 Excelsior Blvd., P.O. Box 650, Mpls., MN 55440, 612/932-5189.

28 and March 1 Basic Life Support Recertification Course; Methodist Hospital; Methodist Hospital; CONTACT: Janell Haugen, Methodist Hospital, 6500 Excelsior Blvd., P.O. Box 650, Mpls., MN 55440, 612/932-5189.

March, 1983

3-5 Clinical Therapeutics — 1983; St. Paul-Ramsey Medical Center; Radisson Plaza Hotel, St. Paul; CONTACT: Ruth McIntyre, St. Paul-Ramsey Medical Center, 640 Jackson St., St. Paul, MN 55101, 612/221-3992.

16 Rheumatology; St. Joseph's Hospital, Brainerd; CONTACT: M.A. Meusing, M.D., 303 Kingwood, Brainerd, MN 56401, 218/829-3568.

16-26 Caribbean Air/Sea Cruise; North Central Medical Conference CME included. CONTACT: Karen Tourdot, Minnesota Medical Association, 2221 Univ. Ave., Minneapolis, MN 55414, 612/378-1875.

17-19 Cardiopulmonary Medicine, 1983; St. Paul-Ramsey Medical Center; St. Paul; CONTACT: Ruth McIntyre, St. Paul-Ramsey Medical Center, 640 Jackson St., St. Paul, MN 55101, 612/221-3992.

18 Difficult Treatment Problems Facing Physicians in Family Practice; Duluth Clinic; St. Mary's Hospital; CONTACT: J. G. Brueggemann, M.D., Duluth Clinic Ltd, 400 E. 3rd St., Duluth, MN 55805, 218/722-8364.

March 1983 (Continued)

19 4th Annual Update Occupational and Environmental Pulmonary Diseases; Midwest Center for Occupational Health & Safety; St. Paul; CONTACT: Ruth McIntyre, St. Paul-Ramsey Medical Center, 640 Jackson St., St. Paul, MN 55101, 612/221-3992.

24-25 Ob/Gyn Update, 1983; St. Paul-Ramsey Medical Center; St. Paul; CONTACT: Ruth McIntyre, St. Paul-Ramsey Medical Center, 640 Jackson St., St. Paul, MN 55101, 612/221-3992.

30-April 6, 7 Basic Life Support Instructor Program; Methodist Hospital; Methodist Hospital; CONTACT: Mary Ann Kempcke, Methodist Hospital, 6500 Excelsior Blvd., P.O. Box 650, Mpls., MN 55440, 612/932-5167.

April, 1983

6-7 Behavioral Medicine; U of M Medical School; Coffman Memorial Union Theater, Mpls., CONTACT: CME, U of M, Box 293 Mayo Memorial Bldg., 420 Delaware St. SE, Minneapolis, MN 55455, 612/373-8012.

8-9 Colorectal/Primary Care; U of M Medical School; Earle Brown Center, St. Paul; CONTACT: CME, U of M, Box 293, Mayo Memorial Bldg., 420 Delaware St. SE, Minneapolis, MN 55455, 612/373-8012.

13-15 Annual Spring Refresher; Minnesota Academy of Family Physicians; Radisson South, Bloomington; CONTACT: Chari Konerza, MN Academy of Family Physicians, 2221 Univ. Ave. SE, Suite 426, Minneapolis, MN 55414, 612/623-9559.

14-15 Pediatric Days; American Academy of Pediatrics, MN Chapter; Rochester; CONTACT: Tony Smithson, Mayo Clinic, E 9A, Rochester, MN 55905, 507/284-2511.

16 Spring Meeting; Minnesota Society of Anesthesiologists; CONTACT: David E. Byer, M.D., 200 1st St. S.W., Rochester, MN 55901.

16 Management of Diabetes Mellitus — 1983; Mount Sinai Hospital; Mpls.; CONTACT: Evelyn Peterson, Mount Sinai Hospital, 2215 Park Avenue, Mpls., MN 55404.

21-23 Allergy and Immunology; U of M Medical School; Mayo Memorial Auditorium, Minneapolis; CONTACT: CME, U of M, Box 293, Mayo Memorial Bldg., 420 Delaware St. SE, Minneapolis, MN 55455, 612/373-8012.

22 11th Annual Pediatric Challenges for Primary Care Physicians; Mpls. Children's Health Center; MCHC; CONTACT: James Moore, M.D., Indian Health Board, 2495 — 18th Ave. So., Minneapolis, MN 55404, 612/721-7425.

23 Spring Meeting; Minnesota Urological Society; Minneapolis; CONTACT: Robert P. Myers, M.D., Dept. of Urology E 17A, Mayo Clinic, Rochester, MN 55905.

25-26 Vitreo-Retinal Disease; U of M Medical School; Holiday Inn, Minneapolis; CONTACT: CME, U of M, Box 293, Mayo Memorial Bldg., 420 Delaware St. SE, Minneapolis, MN 55455, 612/373-8012.

May, 1983

2-6 Family Practice Review and Update; U of M Medical School; Radisson Hotel, St. Paul; CONTACT: CME, U of M, Box 293, Mayo Memorial Bldg., 420 Delaware St. SE, Mpls., MN 55455, 612/373-8012.

12 Medicine; St. Joseph's Hospital; St. Joseph's Hospital; CONTACT: M. A. Muesing, M.D., 303 Kingwood, Brainerd, MN 56401, 218/829-3568.

12-21 Advanced Cardiac Life Support Course; Methodist Hospital; Methodist Hospital; CONTACT: Joan Peterson, R.N., Methodist Hospital, 6500 Excelsior Blvd., P.O. Box 650, Mpls., MN 55440, 612/932-5419.

13 Quarterly Clinical Meeting; Minnesota Dermatological Society, Minneapolis; CONTACT: J. Corwin Vance, M.D., Dept. of Dermatology, HCMC, 701 Park Ave. S., Minneapolis, MN 55415.

13-15 State-of-the-Art in Clinical Anesthesiology; Rochester; CONTACT: David E. Byer, M.D., 200 1st St. SW, Rochester, MN 55905, 507/286-8701.

16-17 Topics and Advances in Pediatrics; U of M Medical School; Location undetermined; CONTACT: CME, U of M, Box 293, Mayo Memorial Bldg., 420 Delaware St. SE, Minneapolis, MN 55455, 612/373-8012.

19-20 1983 Scientific Program; Minnesota Medical Association; Minneapolis; CONTACT: Eugenia C. Kassar, Minnesota Medical Association, 2221 University Ave. SE, Suite 400, Minneapolis, MN 55414, 612/378-1875.

23-24 Basic Life Support Course; Methodist Hospital, Methodist Hospital; CONTACT: Janell Haugen, Methodist Hospital, 6500 Excelsior Blvd., P.O. Box 650, Mpls., MN 55440, 612/932-5189.

23-24 Congenital Heart Disease; U of M; Mpls.; CONTACT: CME, U of M, Box 293 Mayo Memorial Bldg., 420 Delaware St. SE, Mpls., MN 55455, 612/373-8012.

June, 1983

3,4,5 Annual Meeting; Minnesota Thoracic Society; Location undetermined; CONTACT: Fred Rasp, M.D., 606 24th Ave. So., Suite 119, Mpls., MN 55454, 612/333-2156.

10-11 Annual Meeting; Minnesota Obstetrical & Gynecological Society; Barker's Island, Superior, Wisconsin; CONTACT: Mrs. Cammy Kelley or Dr. Carolyn B. Coulam, Mayo Clinic, 200 1st St. SW, Rochester, MN 55905.

10-11 Clinical Hypnosis; U of M Medical School; U of M, St. Paul; CONTACT: CME, U of M, Box 293, Mayo Memorial Bldg., 420 Delaware St. SE, Mpls., MN 55455 612/373-8012.

14, 21, 22 Basic Life Support Instructor Program; Methodist Hospital, Methodist Hospital; CONTACT: Mary Ann Kempcke, Methodist Hospital, 6500 Excelsior Blvd., P.O. Box 650, Mpls., MN 55440, 612/932-5167.

15-18 G.I. Surgery; U of M Medical School; Willey Hall West Bank, U of M, Mpls.; CONTACT: CME, U of M, Box 293, Mayo Memorial Bldg., 420 Delaware St. SE, Mpls., MN 55455, 612/373-8012.

23-25 Behavioral Pediatrics; U of M Medical School; U of M, St. Paul; CONTACT: CME, U of M, Box 293, Mayo Memorial Bldg., 420 Delaware St. SE, Mpls., MN 55455, 612/373-8012.

For further information on future CME programs, contact Department of Education & Specialty Affairs, Minnesota Medical Association, 2221 University Ave. SE, Suite 400, Minneapolis, MN 55414, 612/378-1875.

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Classified advertising rates are forty (40) cents a word; minimum monthly charge \$10.00, key number, \$2.00 additional. Replies to advertisements with key numbers should be mailed in care of Minnesota Medicine, 2221 University Ave. S.E., #400, Minneapolis 55414.

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PEDIATRICIAN — BC/BE to join a 12 doctor multi-specialty group, southern Minnesota community of 12,000 (Trade area 70,000). Fairmont is a progressive city with excellent schools and recreational areas around a chain of five lakes. First year salary guaranteed with full partnership after one year. Contact Don Grandgenett, Administrator, Fairmont Medical Clinic, P.A., Fairmont, MN 56031. (507) 238-4263.

GENERAL SURGEON AND/OR OB/GYN SURGEON to join 10 doctor multi-specialty group in Owatonna, a community of 18,500 located 68 miles south of the Twin Cities and 42 west of Rochester. Present staff consists of 7 family practitioners, 2 internists, and 1 general surgeon. Other specialties in the community and a close working relationship with the Mayo Clinic, the University of Minnesota hospitals, and other metropolitan centers provide for excellent consultations. Guaranteed salary first year with incentive program thereafter. Group Health, disability, life and accident insurance, retirement profit sharing, and automobiles provided by corporation. Contact: J. D. Miller, M.D. or James Wilkus, Administrator, Owatonna Clinic, P.A., 134 Southview, Owatonna, MN 55060. Telephone (507) 451-1120.

ONCOLOGIST or general internist wanted to join three-man group in community of 15,000. Position open summer 1983. Excellent medical facilities. Send C.V. to J. E. McCrery, M.D., 1525 Broadway, Alexandria, MN 56308. (612) 762-2192.

PEDIATRICIAN, board certified/eligible, to join progressive multi-specialty group of 40+ physicians. Pleasant growing community. Many outdoor recreational opportunities. High quality of life. Referral area: 150,000. Liberal financial benefits. Send curriculum vitae and references, Attn: D. C. Schroeckenstein, M.D., 101 Willmar Avenue, Willmar, MN 56201.

DOCTORS NEEDED in Wisconsin and Minnesota, all specialties, all locations. For confidential information, mail your C.V. to Medicus, W62 N281 Washington Avenue, Cedarburg, Wisconsin 53012.

OPENINGS NOW AVAILABLE in Family Practice, OB-GYN, and Orthopedics. The Albert Lea Medical & Surgical Center, Ltd. is actively recruiting for the above positions to be filled hopefully by July-August 1983. We are an eighteen man multi specialty group with excellent benefits. Full participation after the first year. No accounts receivable buy in; incentive income plan; full and complete medical and life insurance coverage; excellent pension profit sharing program. We are recruiting family practitioners for near by satellite clinics. All moving costs assumed by the clinic. Contact G. C. Wilcox, M.D. at clinic (507) 373-1441 or at home (507) 373-6974, or the Clinic Administrator C. C. Lowery at clinic (above), or at home (507) 373-8083.

FAMILY PHYSICIAN FOR PROGRESSIVE RURAL MINNESOTA CLINIC. New and superbly-equipped facility. A pleasant farming community in a physician shortage area, yet only 25 minutes from a metro area. A comfortable call schedule at nearby hospital. Gateway to Minnesota's famous lake country. Young and growing practice with excellent salary and benefits, ownership potential. Must be board-eligible. Call or write to Mr. David A. Nelson or Faris Keeling, M.D. at 218-354-2111 or write to Barnesville Area Clinic, P.O. Box 521, Barnesville, MN 56514.

FAMILY PHYSICIAN to join well established primary care practice. Newly remodeled clinic attached to modern hospital. First year guaranteed plus benefits. Contact Dr. Larry Rapp, Medical Arts Clinic, Elbow Lake, Mn. 218-685-4406 or Russell Sauer — 218-685-5272.

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(Continued from page 61)

ALL OF THE ADVANTAGES . . . An opportunity to practice primary care with a progressive group of physicians that values quality medicine, patient and family — centered practice, continuity of care, service to the community, and group compatibility in a location where the advantages of the Twin Cities are easily available but in a small town with the freedoms of a slower paced atmosphere.

This four-physician Family Practice is interviewing for two Family Practitioners to join the group to meet the patient needs in Glencoe and Lester Prairie, Minnesota. Glencoe is an ideal community — excellent schools, established industry and commerce, accredited hospital — and is only 53 miles from Minneapolis/St. Paul.

We welcome your interest and questions. Please contact Donald B. Rudy, M.D. or Gary Van House, Administrator, Glencoe Medical Clinic P.A. 525 East 18th Street, Glencoe, Minnesota 55336, (612) 864-3116.

GROW WITH US IN THE SUNBELT — The INA Healthplan needs physicians in family practice and most specialties in Miami, Tampa, Dallas, Houston, Phoenix, Tucson and Los Angeles. Attractive salaries and comprehensive benefits including professional development, retirement and profit sharing programs are provided. If team interaction and casual living interest you, send a brief CV to Medical Administration, INA Healthplan, Inc., 7616 LBJ Freeway, Suite 303, Dallas, Texas 75251.

INTERNIST wanted to join established primary care clinic of five family practitioners and a general surgeon. Excellent clinic facility adjacent to hospital. Located in a small town (service area population 15,000) only 22 miles from Duluth providing excellent referral and continuing ed resources. Guaranteed first year salary with good benefit program. Live, work and play on the beautiful north shore of Lake Superior. Position available immediately, but will consider July 1983 starting date. For more information call or write John Bjorum, Executive Director, Community Health Center, 4th Street at 11th Avenue, Two Harbors, MN. 55616. (218) 834-2171.

WANTED: FAMILY PHYSICIAN, Board certified or eligible, to help solo physician in South Minneapolis do full time family practice. First year salary leading to full partnership. Part time work available. Write: Minnesota Medicine-727 2221 University Avenue So. E. #400, Minneapolis, MN 55414.

PATIENTS WANTED: We need patients with pure non-specific vaginitis (*Haemophilus vaginalis*, *Gardnerella*) to participate in a randomized, placebo-controlled trial of the four active components of Sultrin cream versus metronidazole. Patients must be 18 to 65, non pregnant, and must not have received systemic or vaginal antibiotic therapy within the last 6 weeks. Patients will receive \$50.00 for participation and all clinic visits will be paid by the study. For further information please contact: Dr. Marilyn Joseph, University of Minnesota Department of Obstetrics and Gynecology (612) 373-5293.

THE NICOLLET CLINIC has openings for two qualified physicians specializing in Obstetrics-Gynecology. This multispecialty Clinic was founded in 1921 by Department Chairmen of the University of Minnesota Medical School. It now has five fully equipped, modern offices and cosponsors a successful HMO. The Clinic is located in a medical community of high professional standards, ample hospital facilities and an outstanding medical school. Members of the Clinic have the possibility of teaching appointments at this medical school. In addition to excellent fringe benefits offered by the Clinic, the Twin Cities area has exceptional cultural, educational and recreational advantages. Interested physicians should be Board Certified or Eligible. Please send resume and cover letter to: Mr. Mark S. Fisher, Manager, Administrative Services, The Nicollet Clinic, 2001 Blaisdell Avenue, Minneapolis, Minnesota 55404.

GENERAL/FAMILY PRACTITIONER Busy practice in progressive, rural community. Practice includes rotating satellite clinic and call schedules. Salary minimum of \$50,000 and negotiable, excellent benefits, moving/interview expenses, corporate membership available. Well equipped hospital. Abundant recreation. For more information call 701-246-3391, extension 59 or 50, or submit resume to Rolette/Dunseith Clinic, Box 508, Rolette, N.D. 58366.

DERMATOLOGIST, Board certified/eligible to join progressive multi-specialty group of 40+ physicians. Pleasant growing community. Many outdoor recreational opportunities. High quality of life. Referral area, 150,000. Liberal financial benefits. Send curriculum vitae and references, Attn: T. A. Breen, M.D., 101 Willmar Avenue, Willmar, MN 56201.

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OPPORTUNITY FOR qualified physicians at the Albert Lea Clinic, P. A., in Albert Lea, Minnesota. The clinic is a seventeen man multi-specialty group in primary and secondary care fields. The financial rewards are exceptional and practice challenges very attractive. There is a negotiated salary at top level for the first year. Senior physician participation begins at the end of the first year with a incentive income distribution plan plus expanded fringe benefits. The clinic has a low cost buy in with a maximum profit sharing plan. There is a top level insurance program, medical reimbursement program, and a full range of other benefits. A nearly new hospital in the city provides an exceptional place to work. These are choice practices in a delightful place to live. We are currently looking for physicians in general orthopedic medicine, in Otolaryngology, one OB-GYN. We also have positions open in family practice for two physicians for the main clinic and one for a country branch clinic physician. These three must be filled by mid 1983. Please contact B. J. Boss, Administrator, Albert Lea Clinic, P. A., 1602 Fountain Street, Albert Lea, MN 56007. Phone 507-373-8251. Personal phone 507-377-1406 or contact L. E. Shelhamer, Jr., M.D., 507-373-8251 or personal phone 507-377-1530.

COMMUNITY PSYCHIATRIST: Excellent opportunity for diversified practice with stable and innovative mental health organization. Current staff includes one full time and two part time experienced psychiatrists as well as more than 65 other direct care and support staff. Programs include inpatient, partial care, outpatient, special services for children, the elderly, and the chronically mentally ill as well as alcohol and drug dependency, and a very interesting comprehensive pre-paid program with a health maintenance organization. The Center has strong public and private support and serves an area of about 100,000 people. The area has extraordinary four-season recreational opportunities, yet is close to cultural and population centers. Current salary range is \$50,000-65,000 with appointment above minimum possible depending on qualifications. Included also is an attractive fringe package including interview expenses and a generous moving allowance. If interested, please contact Miller A. Friesen, Executive Director, Range Mental Health Center, Box 1188, Virginia, MN 55792 or call (collect) 218-749-2881. AA/EOE

FAMILY PHYSICIAN to join group of six Board Certified Family Practitioners and one Board Certified General Surgeon. Liberal vacation and educational allowances. Competitive salary first year with incentive bonus, and full membership after one year. Blue Earth is a farming town of 4000 in Southern Minnesota with a drawing area of 25,000. 35 bed hospital with adjoining clinic facilities. Complete ancillary support including anesthesiology, radiology and pathology. Excellent opportunity for an aggressive young family physician. Please contact: Thomas E. Watts, M.D., Blue Earth Medical Center, Ltd., 520 South Galbraith, Blue Earth, MN 56013. Phone: (507) 526-7371, Personal Phone: (507) 526-3177, Or Contact: Marjeane Werner, Clinic Administrator, Phone: (507) 526-7371, Personal Phone: (507) 854-3682.

OFFICE SPACE FOR RENT: Physician in Medical Arts Building, 825 Nicollet Mall, Minneapolis, wishes to sublet his facilities to another physician on a part-time basis for the purpose of sharing overhead expenses. Call (612) 370-0553.

ORTHOPEDIC SURGEON wanted to join multi-specialty group consisting of 58 physicians located in west central Wisconsin, a city of 50,000 with a State University of 12,000 — 90 miles east of the Twin Cities. Excellent opportunity for a stimulating practice in a pleasant environment. If interested contact Donald R. Griffith, M.D., Medical Director, Midelfort Clinic, Ltd., 733 West Clairemont Avenue, Eau Claire, Wisconsin 54702 or call (715) 839-5222.

EMERGENCY MEDICINE: Directorship position available in moderate volume emergency department located in northeastern MN. Outstanding income; paid malpractice insurance; and health, life and disability insurance will be provided to the experienced individual. Forty hour work week. For complete details call or write Stephanie Zwibelman, Spectrum Emergency Care, Inc., 999 Executive Parkway, St. Louis, MO 63141; 1-800-325-3982.

INTERNIST, GENERAL. Locum tenens. Bloomington-Lake Clinic. January 1, 1983 (or later) until July 1, 1983. Peter Menge, M.D., 3017 Bloomington Avenue, Mpls, 721-6511.

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Classified Advertisements

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NEUROLOGIST WANTED — To join a very busy, well established neurosurgeon in North Central Wisconsin. Active practice assured, extremely good income potential. New modern office located in a new hospital. Excellent community approximately 65,000 population with unlimited outdoor recreation and very good school systems. For more information contact Lloyd Engstrom. Call collect 715/842-3202 or write P.O. Box 1646, Wausau, Wisconsin 54401.

PROGRESSIVE TWO-MAN practice looking for a third residency-trained family practitioner. Located in northwestern Wisconsin, the distance to Minneapolis is 120 miles, and to Duluth 80 miles. The salary is to include guaranteed base plus incentive as well as other benefits. For further information, please call or write 1-715-635-8795, Family Practice Clinic of Spooner, Spooner Medical Center, P.O. Box 40, Spooner, WI 54801.

PHYSICIAN to replace retiring partner needed for new clinic in Baudette, Mn. Excellent opportunity to live and work in the best fishing and hunting area in Minnesota. If interested please contact Mr. Sergei N. Shvetzoff (218) 386-2160 days (218) 386-2656 Nights or write Practice Management Associates Box 162 Warroad, Mn. 56763.

GENERAL SURGEON. Small, active JCAH hospital in rural Wisconsin close to Minneapolis/St. Paul is seeking a resident, full-time surgeon. Must be Board certified or eligible. All major specialists available for consultation. Write or call CEO. Apple River Valley Memorial Hospital, 221 Scholl Street, Amery, Wisconsin 54001; phone 715/268-7151.

FAMILY PRACTICE PHYSICIANS FOR RURAL MINNESOTA — Large multi-specialty group in West Central Minnesota is opening a satellite in a productive community of 3600 (Benson) which currently has two physicians and looking to replace a retiring physician and add another for growing practice. Pleasant Growing Area, High Quality of Life, Many Outdoor Recreational Opportunities (winter and summer), Progressive, Growing Medical Group, Liberal Financial Benefits, Outstanding Pension and Profit Sharing Program. Call: Bunny Iverson, Willmar Medical Center, Willmar, MN 612-231-5000.

SUN + LAKE = a carefree lifestyle in this convective loop house, which uses passive solar energy as its major source of heat. Two story solarium capture the sun and circulate it through the "envelope". This is a home that takes care of itself while you are away. There are 2800 square feet of living area, 2½ ceramic baths, attached garage, studio, Queen Air fireplace and much more in this quality built home. Located on a 196 foot Pokegama Lake lot near Grand Rapids, it is only 3½ hours north to complete relaxation and privacy. \$149,000. Realty World-Hedman, 813 S. Pokegama, Grand Rapids, MN 55744, 218-326-0386.

NATIVE MINNESOTAN and graduate of the University of Minnesota Medical School finishing Internal Medicine residency in Texas seeks position as General Internist in Minnesota. Michael P. Martin, M.D., 210 East Upshaw, Temple, Texas 76501.

STAFF PSYCHIATRIST CMHC has an excellent opportunity for a staff psychiatrist. Must be board eligible. Programs include in-patient, out-patient, education and consultation, specialized services to children, the chronically mentally ill, and the chemically dependent delivered in conjunction with a seasoned team of multi-disciplinary mental health professionals including two part-time psychiatrists. Excellent four-season recreational area. Salary and fringe benefits negotiable. Contact: Donald E. Frees, ACSW, Area Program Director, P.O. Box 646, Bemidji, MN 56601. An Equal Opportunity Employer.

FAMILY PHYSICIAN to join three Board Certified Family Physicians in a young and growing medical practice in Central Minnesota. The practice is orientated toward Family Practice Medicine and located centrally in the state with quick access to the Minneapolis-St. Paul area. Both practices are a short distance from the St. Cloud area, and our physicians use the St. Cloud Hospital for hospitalization of their patients. Cultural and recreational activities are abundant in this area of Minnesota. The salary and fringe benefits are open and negotiable. If interested, please contact Thomas J. Newton, M.D., Medical Director, or contact Daryl G. Mathews, Administrator, at either the St. Joseph or the Cold Spring Medical Clinics, 26 North Red River Avenue, Cold Spring, Minnesota, 56320, or call collect (612) 685-8641 or (612) 363-7765 in St. Joseph, Minnesota.

INTERNIST-CARDIOLOGIST, INTERNIST-NEPHROLOGIST specialty positions available with Mankato Clinic, Ltd. Our 30 man multi-specialty group attracts specialty referrals from a southern Minnesota area of 200,000 population. Excellent group practice opportunity in All-American community with full hospital services; full range of group fringe benefits; liberal time off; salary first year; incentive pay thereafter. For more information call collect R. F. Roskens, Administrator, or Dr. B. C. McGregory, 507-625-1811.

FAMILY PRACTICE OPPORTUNITY for Waverly, Minnesota. Join group of 2 Family Practitioners in neighboring Winsted. Rural setting, 45 minutes West of Minneapolis. 25 bed Community Hospital with 100 bed Nursing Home attached. \$50,000 first year guarantee plus benefits. Inquire Thomas A. Kiefer, M.D. or Albert M. Sheldon, III, M.D., Winsted Clinic, P.A., Winsted, MN 55395 1-612-485-4151.

LOCUM TENENS, Crystal, Minnesota, for one member of four-member, family practice group for period February 2, 1983 through February 25, 1983. Fee negotiable. (612) 537-8475.

IMMEDIATE OPENING FOR FAMILY PRACTITIONER in Lake Preston, S. Dak. New hospital with 65 bed Nursing Home attached and new Clinic. Excellent financial opportunity near cultural centers: offers wholesome environment plus serving people that appreciate your work. Call (605) 847-4451 or (605) 847-4452.

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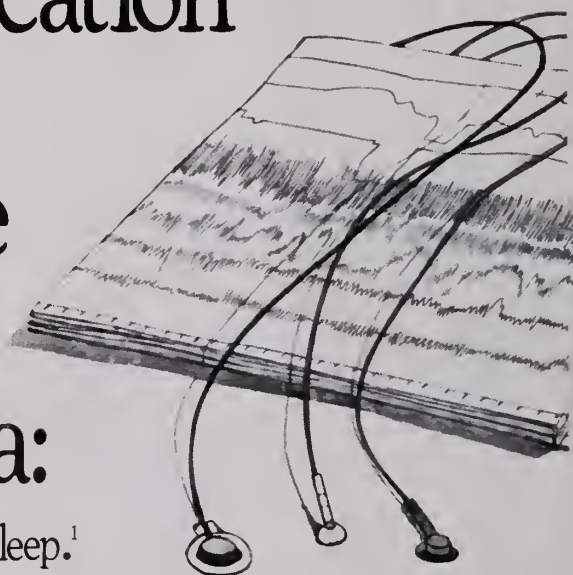
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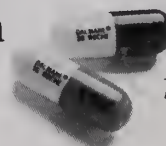
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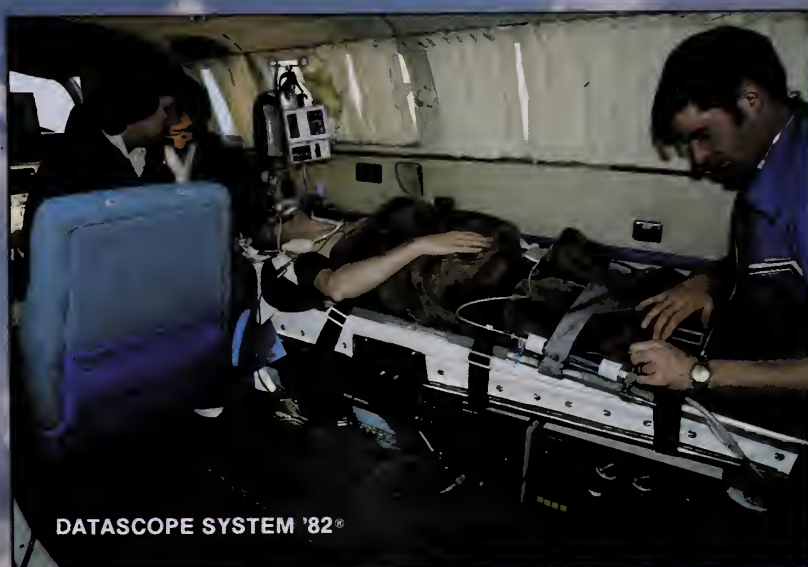
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An added complication... in the treatment of bacterial bronchitis*

Increasing incidence
of ampicillin resistance in
Haemophilus influenzae

Ampicillin Resistant
Haemophilus influenzae

H. influenzae

S. pneumoniae

Brief Summary. Consult the package literature for prescribing information.

Indications and Usage: Cefaclor* (cefaclor, Lilly) is indicated in the treatment of the following infections when caused by susceptible strains of the designated microorganisms:

Lower respiratory infections, including pneumonia caused by *Streptococcus pneumoniae* (*Diplococcus pneumoniae*), *Haemophilus influenzae*, and *S. pyogenes* (group A beta-hemolytic streptococci). Appropriate culture and susceptibility studies should be performed to determine susceptibility of the causative organism to Cefaclor.

Contraindication: Cefaclor is contraindicated in patients with known allergy to the cephalosporin group of antibiotics.

Warnings: IN PENICILLIN-SENSITIVE PATIENTS, CEPHALOSPORIN ANTIBIOTICS SHOULD BE ADMINISTERED CAUTIOUSLY. THERE IS CLINICAL AND LABORATORY EVIDENCE OF PARTIAL CROSS-ALLERGENICITY OF THE PENICILLINS AND THE CEPHALOSPORINS, AND THERE ARE INSTANCES IN WHICH PATIENTS HAVE HAD REACTIONS, INCLUDING ANAPHYLAXIS, TO BOTH DRUG CLASSES.

Antibiotics, including Cefaclor, should be administered cautiously to any patient who has demonstrated some form of allergy, particularly to drugs.

Pseudomembranous colitis has been reported with virtually all broad-spectrum antibiotics (including macrolides, semisynthetic penicillins, and cephalosporins); therefore, it is important to consider its diagnosis in patients who develop diarrhea in association with the use of antibiotics. Such colitis may range in severity from mild to life-threatening.

Treatment with broad-spectrum antibiotics alters the normal flora of the colon and may permit overgrowth of clostridia. Studies indicate that a toxin produced by *Clostridium difficile* is one primary cause of antibiotic-associated colitis.

Mild cases of pseudomembranous colitis usually respond to drug discontinuance alone. In moderate to severe cases, management should include sigmoidoscopy, appropriate bacteriologic studies, and fluid, electrolyte, and protein supplementation. When the colitis does not improve after the drug has been discontinued, or when it is severe, oral vancomycin is the drug of choice for antibiotic-associated pseudomembranous colitis produced by *C. difficile*. Other causes of colitis should be ruled out.

Precautions: **General Precautions**—If an allergic reaction to Cefaclor occurs, the drug should be discontinued, and, if necessary, the patient should be treated with appropriate agents, e.g., pressor amines, antihistamines, or corticosteroids.

Prolonged use of Cefaclor may result in the overgrowth of nonsusceptible organisms. Careful observation of the patient is essential. If superinfection occurs during therapy, appropriate measures should be taken.

Positive direct Coombs' tests have been reported during treatment with the cephalosporin antibiotics. In hematologic studies or in transfusion cross-matching procedures when antiglobulin tests are performed on the minor side or in Coombs' testing of newborns whose mothers have received cephalosporin antibiotics before parturition, it should be recognized that a positive Coombs' test may be due to the drug.

Cefaclor should be administered with caution in the presence of markedly impaired renal function. Under such conditions, careful clinical observation and laboratory studies should be made because safe dosage may be lower than that usually recommended.

As a result of administration of Cefaclor, a false-positive reaction for glucose in the urine may occur. This has been observed with Benedict's and Fehling's solutions and also with Clinistest* tablets but not with Tes-Tape* (Glucose Enzymatic Test Strip, USP, Lilly).

Broad-spectrum antibiotics should be prescribed with caution in individuals with a history of gastrointestinal disease, particularly colitis.

Usage in Pregnancy—Pregnancy Category B—Reproduction studies have been performed in mice and rats at doses up to 12 times the human dose and in ferrets given three times the maximum human dose and have revealed no evidence of impaired fertility or harm to the fetus due to Cefaclor. There are, however, no adequate and well-controlled studies in pregnant women. Because animal reproduction studies are not always predictive of human response, this drug should be used during pregnancy only if clearly needed.

Nursing Mothers—Small amounts of Cefaclor have been detected in mother's milk following administration of single 500-mg doses. Average levels were 0.18, 0.20, 0.21, and 0.16 mcg/ml at two, three, four, and five hours respectively. Trace amounts were detected at one

Some ampicillin-resistant strains of *Haemophilus influenzae*—a recognized complication of bacterial bronchitis*—are sensitive to treatment with Cefaclor.¹⁻⁶

In clinical trials, patients with bacterial bronchitis due to susceptible strains of *Streptococcus pneumoniae*, *H. influenzae*, *S. pyogenes* (group A beta-hemolytic streptococci), or multiple organisms achieved a satisfactory clinical response with Cefaclor.⁷

hour. The effect on nursing infants is not known. Caution should be exercised when Cefaclor* (cefaclor, Lilly) is administered to a nursing woman.

Usage in Children—Safety and effectiveness of this product for use in infants less than one month of age have not been established.

Adverse Reactions: Adverse effects considered related to therapy with Cefaclor are uncommon and are listed below.

Gastrointestinal symptoms occur in about 2-5 percent of patients and include diarrhea (1 in 70).

Symptoms of pseudomembranous colitis may appear either during or after antibiotic treatment. Nausea and vomiting have been reported rarely.

Hypersensitivity reactions have been reported in about 1-5 percent of patients and include morbilliform eruptions (1 in 100). Pruritus, urticaria, and positive Coombs' tests each occur in less than 1 in 200 patients. Cases of serum-sickness-like reactions (erythema multiforme or the above skin manifestations accompanied by arthritis, arthralgia, and, frequently, fever) have been reported. These reactions are apparently due to hypersensitivity and have usually occurred during or following a second course of therapy with Cefaclor. Such reactions have been reported more frequently in children than in adults. Signs and symptoms usually occur a few days after initiation of therapy and subside within a few days after cessation of therapy. No serious sequelae have been reported. Antihistamines and corticosteroids appear to enhance resolution of the syndrome.

Cases of anaphylaxis have been reported, half of which have occurred in patients with a history of penicillin allergy.

Other effects considered related to therapy included eosinophilia (1 in 50 patients) and genital pruritus or vaginitis (less than 1 in 100 patients).

Causal Relationship Uncertain—Transitory abnormalities in clinical laboratory test results have been reported. Although they were of uncertain etiology, they are listed below to serve as alerting information for the physician.

Hepatic—Slight elevations of SGOT, SGPT, or alkaline phosphatase values (1 in 40).

Hematologic—Transient fluctuations in leukocyte count, predominantly lymphocytosis occurring in infants and young children (1 in 40).

Renal—Slight elevations in BUN or serum creatinine (less than 1 in 500) or abnormal urinalysis (less than 1 in 200).

[061782R]

*Many authorities attribute acute infectious exacerbation of chronic bronchitis to either *S. pneumoniae* or *H. influenzae*.

Note: Cefaclor is contraindicated in patients with known allergy to the cephalosporins and should be given cautiously to penicillin-allergic patients.

Penicillin is the usual drug of choice in the treatment and prevention of streptococcal infections, including the prophylaxis of rheumatic fever. See prescribing information.

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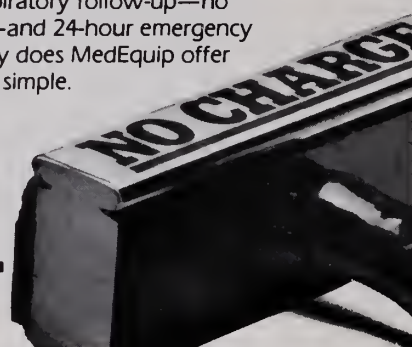
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President's Letter



Preferred Provider Organizations

A recent article in the Minneapolis Star-Tribune noted that three Preferred Provider Organizations (PPO) would become operational in the spring of 1983. Two are hospital based and one PPO is physician based. This letter is an attempt to provide information to our membership on the present status of this alternative form of health care delivery.

A Report of the AMA Council on Medical Service defines PPOs as follows: "A PPO is a group of hospitals and physicians which contract with employers, insurance carriers, or third party administrators to provide comprehensive medical service on a fee-for-service basis to subscribers". Patients are encouraged by economic incentives, such as the modifying of co-payments and deductibles, to use the "preferred" physicians and hospitals. The insuring entity could be Blue Cross-Blue Shield of Minnesota, a self-insured employer, or a Union Trust Fund, as examples. A variety of agreements may exist between the PPO physicians, hospitals, and the insuring entity. There is also no capitation feature or pre-payment.

Negotiated fee schedule between PPO providers and buyers may or may not be at a discount, although studies reveal that most PPO providers have agreed to accept 80-85% of the "usual and customary" fee. There are facts that make a negotiated fee palatable to PPO providers. First, participation in the PPO enlarges the patient base of the physicians and hospitals involved. This is viewed as a means of contesting the competitive influence of other alternative health delivery systems or the increasing supply of physicians. As an aside, it is noted that PPOs appear on the scene in those areas where HMOs are increasing their market share. Secondly, rapid claim payments offer improved cash flow. Finally the PPO providers are at a limited or no financial risk since payment is on a fee-for-service basis.

In order for a PPO to be effective at cost-containment, it can select hospitals and physicians who already provide quality care at lower cost, alter reimbursement mechanisms to create positive incentives for a conservative style of practice, and institute control mechanisms that will eliminate unnecessary service and prodigal provider behavior. At the present, most PPOs appear to rely on utilization review mechanisms of various types to control costs.

Dr. Richard Frey of Minneapolis will head a physician-based PPO slated for opening in the spring of 1983. He has been and remains involved in the MMA. His field of expertise is medical cost containment of quality care. He anticipates a group of approximately 230 primary care physicians (family physicians, internists, pediatricians and obstetricians). The "Gatekeeper" concept will be used. The physician will be responsible for appropriate utilization and cost containment. This PPO will have no pre-set fee schedules, but if one's patient cost profile is too high, such physicians eliminate themselves as "preferred providers." Likewise, a secondary or referral physician must show ability in cost containment. This program will be watched with interest.

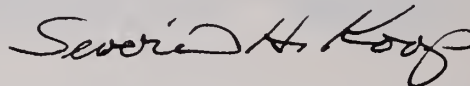
Your MMA has been actively involved with the complexities of this issue. On 10-30-82, the MMA Board of Trustees authorized an Ad Hoc Committee on PPOs. This committee and staff have met on several occasions with physicians and staff representatives of the Ramsey County Medical Society, Hennepin County Medical Society, Minnesota Academy of Family Physicians, and the Foundation for Health Care Evaluation. This group has met with legal counsel and the Blues of Minnesota. We have given conceptual support to efforts of Blue Cross-Blue Shield of Minnesota to develop a PPO-type program which would offer broad-based opportunities for participa-

PRESIDENT'S LETTER

tion by physicians, hospitals, and others. This is conceptual support only and not to the exclusion of other PPOs.

Your MMA will continue to monitor PPOs which develop in Minnesota and keep the members informed of the structure and extent of provider enrollment in

such plans. We have been and continue to explore the possibility of the MMA serving as an organizational center for PPOs.



Severin H. Koop, M.D.
President
Minnesota Medical Association

PPO Guidelines

On January 15, 1983, the MMA Board of Trustees approved the following guidelines for use by physicians contemplating the development of, or involvement with, a PPO program. These guidelines were adopted from principles developed originally by the Hennepin County Medical Society.

1. The PPO plan, as with any other plan, should address overall health care costs to the community, not just cost-cutting mechanisms within its own selected population.
2. The PPO plan should incorporate the concept that physicians must be integrally involved in the planning, organization, and management of all plans involving the delivery of health care services.
3. The PPO plan should provide incentives for consumers to make cost-effective choices in their own health care. First dollar coverage and total coverage are disincentives.
4. The PPO plan should provide incentives to hospitals to reduce the expenses of providing their services.
5. The PPO plan should provide financial incentives which reward patients for cost-effective behavior.
6. The PPO plan should support continuity of care, the development of a continuing relationship between physician and patient.
7. PPO planning must recognize the role of the physician as the purchasing agent of health care for his patient. The plan should measure this function, and reward good performance. This role is probably more important than fee level in determining who is a high cost and who a low cost provider.
8. Similarly, the PPO plan must provide for assessment and maintenance of quality of care, by some mechanism of peer (that is physician-controlled) review.
9. The PPO plan must assure the physician's role as advocate for the needs of each patient. The physician must never be placed in a position of becoming the patient's adversary as an agent for a health plan.
10. The PPO, as with any other plan, should in some way recognize the need for education in the health sciences, and the costs involved.
11. Data systems relating to physician performance have several requirements.
 - a. The often complex medical information must be interpreted by physicians.
 - b. Methodology should be developed to identify the severity/acuity of individual cases so that fair comparisons can be made.
 - c. Physicians should have access to detailed information concerning their own "practice profile"; the data system should also facilitate the comparison of physicians with similar practices.
 - d. Aggregate data should be used to establish community norms. Data about any individual should be made available to that individual for personal comparison and education.
12. Advertising for PPOs, like any physician advertising, must be fair, objective, and truthful. It should clearly state any limitation in the manner in which services are to be provided.
13. PPOs should not limit physicians to participation in a single PPO.



Editor's Notebook

Touché

In my December 1982 editorial, "Texas Talk," I listed 28 rules for helping achieve readability in scientific articles. I felt rather smug about my list until I received the following letter:

Dear Dick:

It was an excellent idea to combine the various rules, as you did in your last editorial. I have used these rules to help rewrite your rules. In addition, I was reminded of a rule I have often used, but seldom seen in other lists. "Avoid verbs with prepositions; they are usually weak and ambiguous."

Keep up the good work.

Sincerely,

Martin G. Netsky, M.D.
Professor of Pathology
Vanderbilt University
Nashville, Tennessee

Here is Doctor Netsky's edited version of my rules:

Reece's Rules of Readability

1. Remember ~~there is no~~ ^{the only} good writing ~~only~~ ^{is} good rewriting.
2. Replace the far-fetched word with the familiar.
3. Make the abstract concrete.
4. Prefer the single word to the circumlocution.
5. Choose the short word over the long.
6. Speak naturally rather than in the ~~habitual~~ ^{habitual} goobledgook of your specialty.
7. Avoid clichés or other expressions you ~~are used to seeing~~ ^{they} in print.
8. ~~Cut out~~ ^{omit} all possible words.
9. Write in active rather than passive voice.
10. Simplify so every word counts.
11. Use personal pronouns "I" and "we" ~~to achieve~~ ^{for} directness, clarity, and brevity.
12. Shorten sentences; ~~keep them~~ ^{to} an average of 18 words or less.
13. Go easy on ~~polysyllabic~~ ^{polysyllabic} words of three syllables or more, keeping them down to less than 15 per 100 words.
14. Crop ~~and tighten~~ ^{and tighten} paragraphs; aim for an average of 125 words or less.
15. Insert subheadings as signposts so your reader can follow the flow, logic, and development of ideas.
16. Rearrange sentences to ~~remove~~ ^{remove} the words *that*, *by*, *which*, *who*, and *whom* because these words are danger signs of longwindiness.
17. Use strong transitive verbs rather than weak forms of the verb *to be*: *is*, *am*, *are*, *was*, and *were*.
18. Excise these weak qualifying adjectives — *very*, *quite*, *much*, *rather*, *somewhat*, and *approximately*.
19. Search for nouns ending in *-ion* and convert them into verbs.
20. Give rhythm to your prose by varying sentence length and sentence type, asking rhetorical questions, and even throwing in sentence fragments.

EDITOR'S NOTEBOOK

21. Let your prose speak for itself, keeping ^{de} your opinions to yourself and not overstating ^e your case.
22. Revise your paper after ^{placing} letting it ^{few} sit in a drawer for a couple of days, then re-attack it with a fresh mind.
23. Read your work aloud and ask: "Would I say that to a friend?" for a spark of human understanding must exist between writer and reader, just as it does between friends.
24. Cultivate unsparing critical colleagues and encourage them to evaluate your work.
25. Show your readers the courtesy of translating the less familiar into the more familiar, the complex into the simple, and the vague into the precise.
26. Think critically, document your findings, and cover your subject.
27. ^{Discard} Throw your paper ^{out} and rewrite it if the paper makes the simple complex.
28. Break any of these rules if they offend your stylistic or scientific sensibilities."

Doctor Netsky's editing improves my rules and reinforces the importance of rule 24: cultivate unsparing critical colleagues and encourage them to evaluate your work.

His superb editing job reminds me of the story of a conversation between a doctor and his small son:

Doctor: "Yes, you may ask a question, son, but make it short."

Small son: "Well, when a doctor gets sick and another doctor doctors him, does the doctor doing the doctoring have to doctor the doctor the way the doctor being doctoring wants to be doctoring, or does the doctor doing the doctoring of the doctor doctor in his own way?"

In the current situation, when the editor erred and another editor edited him, the editor doing the editing edited the editor in a way the editor being edited wanted to be edited because the editor doing the editing edited in his own way.

Richard L. Reese MD

"to promote understanding and education of lupus erythematosus . . ."



- support groups for patients and relatives
- general meetings and seminars with medical and allied professionals
- continuing education program for RNs
- educational materials

contact:

Minnesota Chapter
Lupus Foundation of America, Inc.
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Hydrops of the Gallbladder in Children

Diagnosis and Management

DAVID W. TODD, M.D.,* WILLIAM C. ROSEN, M.D.,* RON H. MILLER, M.D.*

A 33-month-old child with hydrops of the gallbladder with associated scarlet fever was diagnosed through ultrasonography. Following early diagnosis, the patient was managed by cholecystostomy. The advantages of this procedure over others employed in the treatment of acute hydrops are discussed.

ULTRASONOGRAPHY OF abdominal masses in children has recently become a well accepted diagnostic tool.¹ The association of acute hydrops of the gallbladder and scarlet fever is recognized by pediatricians and pediatric surgeons. Knowledge of this association leads to early diagnosis through ultrasonography.

Cholecystostomy has been advocated as the treatment of choice for hydrops of the gallbladder in children requiring surgery.^{4,8,9} The following case study involves diagnosis and management utilizing ultrasonography and cholecystostomy.

Case History

A 33-month-old male was admitted with a 24-hour history of fever to 104°F. and cough. He had one emesis prior to admission and had been started on oral Ampicillin during the preceding evening. His right anterior cervical lymph nodes were enlarged and tender, but the throat appeared clear. Chest exam revealed mild retractions, scattered expiratory wheezes and rales in the right base posteriorly. The abdominal exam and chest x-ray were negative. A throat culture taken at the time of admission indicated that Group A (beta-hemolytic) streptococci were present. His complete blood count showed a hemoglobin of 13.5 gm. and a white blood count of 23,000 with 89% neutrophil and 7% bands. The blood cultures were negative. The patient was started on 1 gram of intravenous Ampicillin every six hours.

On the day following admission, the patient remained febrile and appeared more toxic. Exudative tonsillitis was now noted to be present. A lumbar puncture was normal with a subsequent negative culture.

The patient developed a scarlatiniform eruption on the second hospital day. Ampicillin was discontinued and IV Penicillin G was begun.

The spiking fever to 104°F. continued on the third hospital day, and by the fourth day, the patient developed right upper quadrant fullness and tenderness. He appeared more toxic and was not jaundiced. His white blood count was 6,500 with 40% segmented

neutrophils and 20% bands. The reticulocyte count was 1.5%, sedimentation rate was 72, and the monospot was negative. His total bilirubin was 3.9 mg. % with a direct bilirubin of 3.2 mg. %. The SGOT was 29 units (normal 0-17). Acute hydrops of the gallbladder was then suspected. Ultrasonography of the abdomen revealed a grossly dilated gallbladder and cystic duct.

On the fifth hospital day, the abdominal tenderness increased and the patient was taken to surgery where a dilated, tense gallbladder containing clear fluid was encountered. Cholecystostomy was performed using a 12 Foley urethral catheter. Two ccs of normal saline were placed in the balloon, which was held in place with two purse string sutures. The gallbladder was tacked to the abdominal wall where the tube exited for additional security. Cultures of the gallbladder contents and peritoneal fluid were sterile. The liver function studies returned to normal and a tube cholecystogram showed a normal gallbladder, normal cystic duct, and normal bile ducts with good emptying into the duodenum. The cholecystostomy tube was removed on the fourteenth postoperative day. The postoperative course was uneventful, and the patient was discharged on the sixteenth hospital day.

Discussion

A case of hydrops of the gallbladder associated with scarlet fever was reported by Hadley in 1908.² This case was also treated by cholecystostomy. Ternberg and Keating presented seven cases of acute acalculous cholecystitis in children which were all treated by tube cholecystostomy. Leptospirosis accounted for four of the cases, diarrhea for two, and third degree burns for one.³ It is therefore apparent that cholecystitis and hydrops occur with several disease entities. In most cases, the bile is sterile which may indicate that the hydrops is due to the effects of the primary disease (dehydration, fever, ileus and biliary stasis) rather than direct bacterial invasion of the biliary structures. Lymphadenopathy as a cause of obstruction does not seem to occur.⁴ Myocutaneous lymph node syndrome has been known to cause hydrops of the gallbladder, which has often been treated conservatively and the cholecystitis receded.¹¹ Only when abdominal findings do not improve with conservative treatment is

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surgery indicated.

An acute abdomen in a child with a preceding febrile illness should cause the clinician to suspect acute hydrops. A preoperative diagnosis can be made by ultrasound, which is a technique widely used in the evaluation of abdominal masses in children.⁵ It is fast, non-invasive, and emits no ionizing radiation. The gallbladder is an ideal organ for ultrasonic examination as the agreement between ultrasonic and operative findings is 96%.⁶ In anatomic areas not applicable to sound waves such as lung and bone, however, CT scanning is clearly preferable.⁶ Due to the similarity of symptoms involved with both acute cholecystitis and a high-lying inflamed appendix, earlier reports suggested that diagnosis could only be accomplished by laparotomy.⁷ Ultrasonography can readily make this differentiation preoperatively as well as eliminating other diagnostic considerations such as intussusception. In addition, ultrasound also aides in

distinguishing between acute hydrops and other causes of cholecystitis which occur in children such as malformation of the bile duct system and cholelithiasis.

We feel that cholecystostomy is the treatment of choice for hydrops of the gallbladder in children requiring surgery as it is an effective and relatively simple procedure. Dye studies done through the cholecystostomy tube following the surgery have demonstrated a completely normal gallbladder, cystic duct, and bile ducts.⁷ A gangrenous or perforated gallbladder would naturally be exceptions to this recommendation.

Early ultrasonic diagnosis of acute hydrops of the gallbladder treated by simple cholecystostomy when surgery is required is most effective in preventing morbidity from this entity. Through the utilization of this rational approach, unnecessary over-treatment can be avoided.

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Continuing Medical Education University of Minnesota

Annual Ophthalmology Specialty Course, "Current Management of Vitreo-Retinal Disease" April 25-26, 1983, Holiday Inn Downtown, Minneapolis, Minnesota

Guest faculty will include Doctors William E. Benson, Philadelphia, PA; Robert J. Brockhurst, Boston, MA; Helmut Buettner, Rochester, MN; Devron H. Char, San Francisco, CA; Gerald A. Fishman, Chicago, IL; Jack J. Kanski, UK; David H. Orth, Chicago, IL; and Dennis M. Robertson, Rochester, MN. For Further Information please contact: The Office of Continuing Medical Education, University of Minnesota Medical School, Box 293 Mayo Memorial Building, 420 Delaware Street S.E., Minneapolis, MN 55455. Telephone 612/373-8012

Minnesota Chapter of the National Foundation for Ileitis & Colitis (NFIC)

The second public educational meeting of NFIC will be held Thursday, February 24, at 7 p.m., in Auditorium 2-650 of the University of Minnesota Health Services Building "A" on Washington Avenue.

Speaking on "Current Research on Inflammatory Bowel Disease" will be Dr. I. Dodd Wilson, chief of gastroenterology at the University of Minnesota Hospital, and Dr. Roger Gebhard, Assoc. Professor, U of M, and Staff Physician at the VA.

The meeting is free and open to the public. A question and answer period will be moderated by Dr. David I. Weinberg.

Contact: Rita Hattouni 370-3195 (work) 781-0812 (evenings).

Ectopic Pregnancy

Critical Analysis of 139 Cases

M. FATHI KAMSHEH, M.D.*

In a seven-year study on ectopic pregnancy at Fairview Hospital, and statistical review of two other hospitals in Minneapolis, revealed that the rate of ectopic pregnancy has been increasing steadily.

A retrospective critical analysis of 139 consecutive ectopic pregnancies was done.

The main factors causing diagnostic delay were discussed, the increased incidence of ectopic pregnancy in relation to previous pelvic inflammatory diseases, the use of intrauterine contraceptive devices, previous induced abortions, and the history of infertility have been discussed.

The diagnostic dilemma based on signs and symptoms, pregnancy tests, culdocentesis, ultrasonography and laparoscopy, has been assessed.

Careful application of these tests together with a good history will minimize the number of undiagnosed ectopic pregnancies, and prevent delay in definitive surgical treatment.

AN INCREASE in the incidence of ectopic pregnancies has been observed in many countries in Europe as well as the United States. The following report was undertaken to review our experience at Fairview Hospital between the years 1975-1981. The number of ectopic pregnancies has more than doubled.

Ectopic pregnancy is responsible for 6-13% of maternal death in the United States.^{1,2} Recent maternal mortality statistics (1965-1977) show that the annual number of deaths from ectopic pregnancy had decreased from 59 to 39; however, death from ectopic pregnancy as a percentage of all maternal death increased from 6.5% to 10%, leading to a major public health problem.¹

Material and Methods

The hospital records of 139 cases in 132 patients discharged from Fairview Hospital with the diagnosis of ectopic pregnancy during the period from January, 1975, to September, 1981, were reviewed. This study consists of a clinical evaluation, including, etiology, diagnosis, and therapy as well as critical analysis of the high risk patients in whom diagnosis was probably delayed.

Results

Incidence

The overall incidence of ectopic pregnancy at

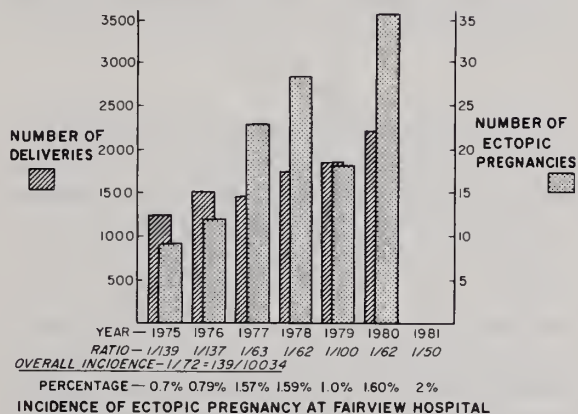


Figure 1

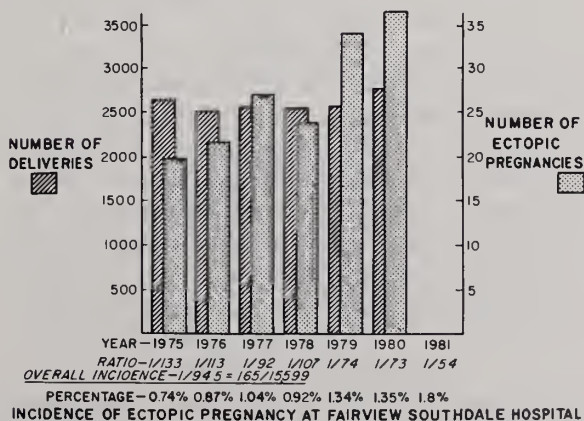


Figure 2

*Clinical Assistant Professor, Department of Obstetrics and Gynecology, University of Minnesota Medical School, Minneapolis.

Fairview Hospital during the period under study was 1 in 72 live births (Figure 1). This was a significant increase from the reported incidence of one in 242 live births by Stromme and McKelvey in 1962.^{3,4} A similar increase was found in two other hospitals in Hennepin County. Fairview Southdale had one in 94 (Figure 2) and at North Memorial one in 83 (Figure 3).

Age

The age range was 18-42 years with the largest number occurring between the ages 26-30 years (Figure 4). The remaining cases were equally distributed below the 25 year and above the 30 year range.

Contraception

The great majority of patients, 83 or 62.9%, used no contraceptives. 22.7% used or were using an intrauterine contraceptive device. 6.8% had tubal sterilization. 3.8% were using birth control pills (Figure 5).

Looking at the comparative risk for current contraceptive users, including I.U.D. users, these women were less likely to have had an ectopic pregnancy than women not currently using contraceptives. That compares well with other reports.^{5,6,7}

Parity

Figure 6 indicates the importance of fertility and low parity in association with increases in ectopics. However, previous parity and even grand multiparity certainly doesn't exclude ectopic pregnancy.

Etiology

A history of infertility was found in 25.5%. A history of previous pelvic inflammatory disease was found in 22.3%. Nine patients (6.4%) had previous ectopic pregnancies, and nine patients had previous tubal sterilization. Among the 30 patients who used an intrauterine contraceptive, the device was removed in 17 patients. Within two weeks prior to diagnosis, the device was removed in surgery in four patients, and spontaneously expelled in one. The remaining devices were removed within six months. Careful evaluation of these cases revealed that often the device was removed to overcome symptoms, which eventually were established as being due to ectopic pregnancy, thus causing a delay in diagnosis. Many authors note this association. Tatum and Schmidt observed that 4% of pregnancies with I.U.D.s in place were ectopic.^{7,8}

Presenting Symptoms

The classical triad of pain (93%), amenorrhea (77%), and vaginal bleeding (74%) were the most

common.

In addition, dizziness, weakness, and episodes of syncope accounted for the largest number (31%) of additional symptoms. The remaining symptoms were shoulder pain (17%), gastrointestinal symptoms (10%), and rectal pain (7%).

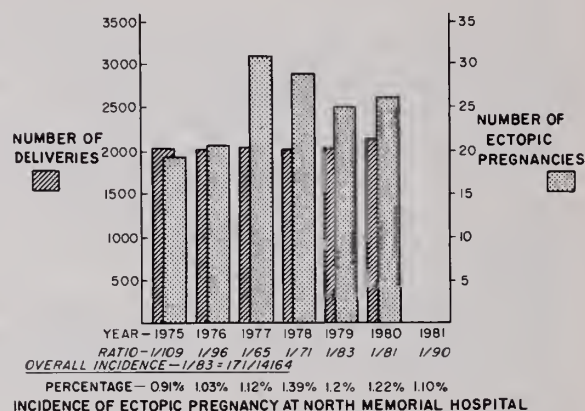


Figure 3

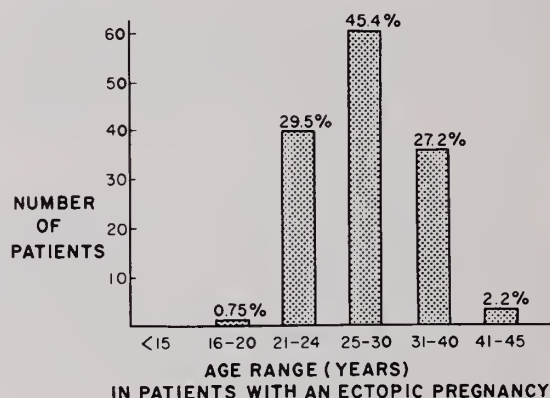


Figure 4

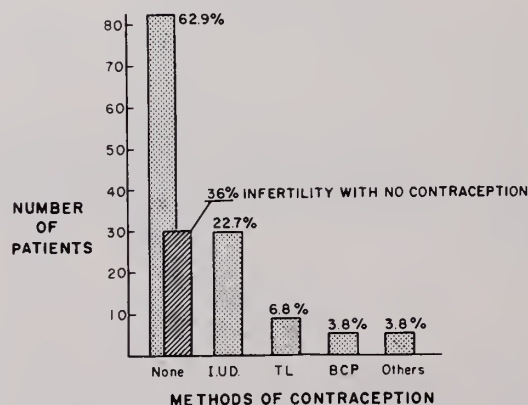
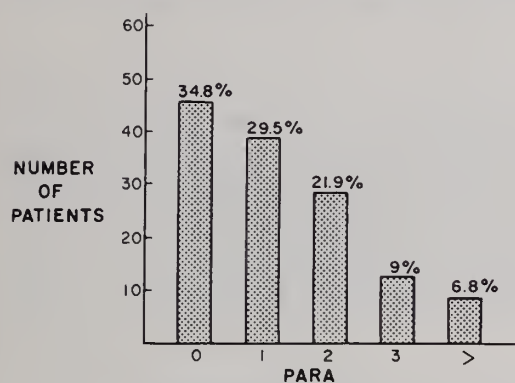


Figure 5

Diagnostic Studies

Pregnancy Test

No such test was performed on 27%. The remainder had urinary pregnancy tests and the results were found to be negative in 22%. Serum pregnancy tests were done on 20% and results were positive in 100%.



PARITY IN PATIENTS WITH AN ECTOPIC PREGNANCY

Figure 6

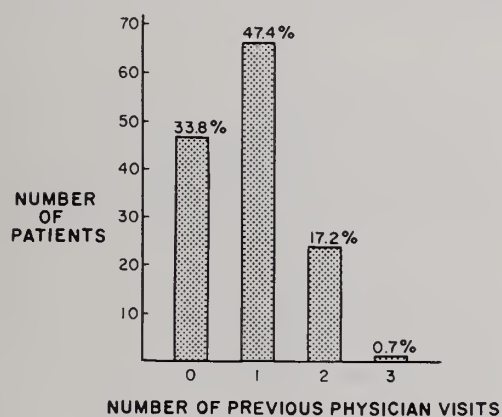


Figure 7

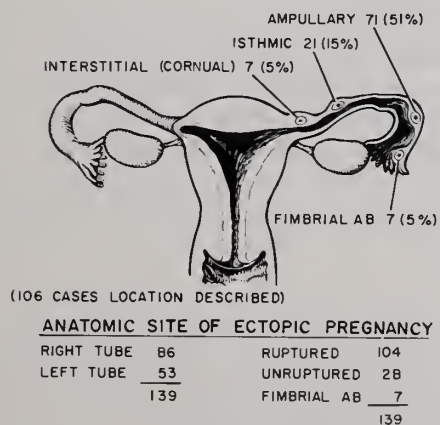


Figure 8

Culdocentesis

Done in 25 patients and results were positive in 68%, negative in 20%, and equivocal in 12%.

Laparoscopy

Done in 38% and ultrasound done in 12%.

Delay in diagnosis of ectopic pregnancies and intraperitoneal hemorrhage are the main reasons for maternal mortality and morbidity. In our study we found only 33% came directly to emergency care and treated immediately (Figure 7), but 47.4% have visited their primary physician once before diagnosis was made, and 17.2% had visited their physician twice before diagnosis was established. Our experience compares well with the report of O'Neil¹¹ when he stated that 77% of patients were sent home after their initial presentation with symptoms of their ectopic pregnancies.

Anatomic Location

Figure 8 shows that all cases in our series were located in fallopian tubes. It should be noted that an intact tubal pregnancy without hemoperitoneum was found in 28 patients (20%) which was higher than that of Breen and McBride but less than De Cherney.^{2,8,10}

Treatment

Salpingectomy was the treatment of choice in 88%; 12% of the patients had ovarian cystectomy, 12% had elective tubal sterilization, 16.5% had endometrial curettage, and 3.5% had total abdominal hysterectomy. Estimated blood loss found in the peritoneal cavity ranged from > 100 cc ml to > 4000 cc. For those who showed signs of shock on admission the estimated blood loss was 1500 cc or more while those with stable vital signs had an estimated blood loss of 800 cc or less.

Blood transfusion for the shock group averaged three units per patient while the non-shock group received an average of two units.

Discussion

Our experience at Fairview Hospital and the review of other hospital statistics would indicate an increased incidence of ectopic pregnancy is on the rise.

The increasing importance of ectopic pregnancy as a cause of maternal death presents not only a major public health problem but a challenge that will be met when primary care physicians combine a high index of suspicion with particular attention to the following:

Infertility patients and those not using birth control, history of recent abortion or menstrual extraction, history of P.I.D., history of I.U.D. or recent removal of an I.U.D., and patients with history of previous

tubal sterilization, tubal pregnancy, tubal reconstructive procedure, and abdominal surgery.

Careful application of diagnostic tools will be most helpful. (1) The serum HCG will give results in a few hours and within a few days of conception. (2) Ultrasonography is helpful in visualizing endometrial cavity and pelvic pathology. (Accuracy 71-80%).⁶ (3) Culdocentesis is helpful if positive (70-85%).^{8,9} (4) Laparoscopy is essential for early diagnosis. May not

be necessary in delayed and already ruptured cases.

Despite refinement in diagnostic procedures, mortality percentage had doubled within the past decade.

High index of suspicion, thorough history and physical examination remain the cornerstone of early diagnosis and therapy; thus, preserving fertility, reducing the incidence of morbidity and eliminating mortality associated with ectopic pregnancy.

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Sixth Annual Black Hills Seminar

The Sixth Annual Black Hills Seminar on Advances in Clinical Pediatrics — June 22, 23, 24, 1983, at Sylvan Lake Resort, Custer, South Dakota, sponsored by the Department of Pediatrics and Adolescent Medicine, University of South Dakota School of Medicine. Guest faculty include Drs. C. Warren Bierman, Alvin H. Jacobs, Melvin Levine and Philip Sunshine. For complete conference information contact:

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Injury vs. the Law

CARL O. RICE, M.D.
Editor Emeritus

Injury, because of its concern with the law, needs, perhaps, a bit of clarification: Injuries are of a large variety, and for the convenience of this evaluation, might be classified as non-organic and organic. Like all other diseases, each of these has its own etiology, symptoms, duration and end results. Injury, though it can occasionally be temporarily delayed in its own healing period, because of underlying preexisting disease, does not cause other disease and only rarely does it aggravate other disease.

Non-Organic Injuries

The non-organic injuries consist of bumps, contusions, strains, and sprains. Though these may have caused pain, no organic damage has been sustained. The nature of a bump or a contusion is obvious.

Strain

Strain is comparable to the discomfort after pitching a ball for an hour or two, and thereafter causing soreness in the shoulder. Recovery is complete in a few days, leaves no residue, no organic damage, and no permanent disability.

Sprain

Sprain is a bit more strenuous than strain, causing pain, ecchymosis and swelling. These symptoms will subside and disappear in a matter of a few weeks, without permanent disability.

Chronic Strain vs Sprain

There is no such thing as chronic strain or sprain, an intriguing term that has been used in the language of litigation to indicate the pain that develops in the area of a previous strain or a preexisting defect. It would be more accurate to refer to chronic strain as recurrent strain with a new incident: working stooped, riding long distance, tedious work, lack of trim — the list may be replete. The symptoms of strain or sprain may be prolonged because of underlying disease, but not for long.

Aggravation of Pre-existing Disease

Written into the law is a term "aggravation of a preexisting disease," which was designed to provide compensation to an individual if the disease itself had

been actually made worse. The law specifically does not speak of aggravation of the symptoms of the disease which can be, temporarily, aggravated by injury. After the effects of injury have subsided, the disease goes on its own schedule, no worse than it was prior to the incident.

Aggravation of Symptoms of Disease

The aggravation of symptoms versus the aggravation of the disease might well be illustrated by a patient who has a painful toe due to gout; non-organic injury superimposed upon such a painful toe would temporarily aggravate the symptoms — the pain of gout, but after the effect of the non-organic injury has subsided, the disease of gout with pain in the toe persists and remains until the treatment of the gout has been effective.

Another example might be that of an individual with diabetes, in which non-organic injury superimposed upon an individual with diabetes may cause the symptoms of diabetes to be temporarily aggravated, requiring more insulin for a short period of time. As soon as the effects of the non-organic injury have subsided, the diabetes then goes back on its own schedule, responding to treatment in proportion to the accuracy of the treatment, just as it had done prior to the incident of injury. The presence of diabetes can also delay the healing of an injury. The disease of diabetes has not been altered; it has not been made worse.

A third example might be that of a patient with arthritis in both knees (or elsewhere), in which the injured knee joint would develop increased symptoms for a period of time. The pre-existing arthritis could be a factor in delaying the recovery of the injury, though eventually the injury, depending upon its severity, would run its course. Pain, in the arthritic area, extending beyond the healing period of injury is then due to the lingering arthritis and should be responsive to the treatment of arthritis. To continue to treat arthritis as an injury merely delays the benefit that might otherwise be obtained.

A fourth example might be that of a woman who contused her breast on a shelf. Because of the contusion she most logically would have examined her

breast a bit more thoroughly than she usually did when taking a bath, and in this more thorough examination she may have discovered a mass in the breast.

The Supreme Court in the State of Minnesota, by awarding damages, has designated such an incident as being the causative factor for carcinoma. The incident of contusion was merely superimposed upon an occult cancer of the breast that had not been detected up to that moment.

Organic Injuries

More extensive are the major-organic injuries: disruptions, lacerations, tearing of ligaments and muscles, rupture of tissues and fracture of bones. The variety may be simple, compound or complex. Depending upon the severity of the organic injury, the initial period of pain and discomfort may extend for

two to six weeks. The healing period may extend for a few months or a year, and at the end of the healing period a permanent disability may result. These present no problem. At the end of healing, preexisting disease is again on its own schedule; rarely made worse.

Conclusions

When an individual does not recover in the usual period of time following a nonorganic injury, it is up to the doctor to search for a more logical cause for continuing symptoms.

Must we impute an incident just because the disease persists? Post hoc logic in medicine is not sound reasoning.

Book Report

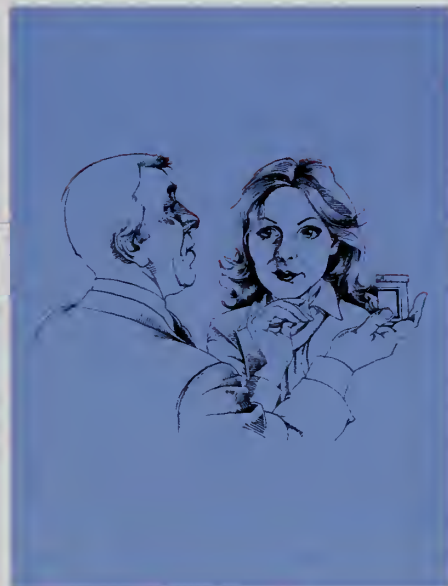
A Peek Into the Life and Philosophies of a Surgeon, Carl Rice, M.D., PhD, published 1982 by Master Printing, Inc., Minneapolis, Minnesota

Ten years ago, on the occasion of Carl Rice's retirement as Editor-in-Chief of *Minnesota Medicine*, I described Carl as a *why not* man. It was Carl, after all, who asked in the mid-1920s *why not* inject procaine directly into fractures to reduce the pain; it was Carl who asked in 1929 *why not* place a penny on the anal dimple of infants with imperforate anus, turn them upside down, X-ray them in the inverted position, and measure the distance between the penny and rectal gas; it was Carl who asked in the late 1930s *why not* make sutures and needles part of the same functional unit, and the swaged surgical needle was born; and it was Carl who asked *why not* remove breast tissue from below rather than above, and *why not* call the operation an adenomammectomy. And it was Carl, now in his mid-eighties, who asked last year *why not* write an autobiography on my own terms.

And so he has. This is an unconventional autobiography, printed privately and distributed to personal friends and family. I was privileged to receive a copy. From most authors, you expect a precise chronological summary. Not so with Carl. He mixes tributes to his wife, Lillie, with cartoons, anecdotes, philosophical essays, obituaries, humorous asides, and photographs of a lifetime. Included in these pictures are poignant photographs of Lillie as an impish child, college woman, young bride, and as a successful surgeon's wife.

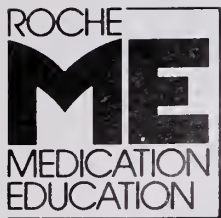
As this book vividly illustrates, creativity and energy don't necessarily diminish proportionally with age. Even now, Carl continues to practice medicine, skies downhill, draws cartoons, carves delightful wooden figures, and works like a trojan landscaping his seven acre Edina grounds, and his 800 acre South Dakota farm. Carl calls his book a "peek" into his life. But it is more than that. It is a testament to his drive, talent, flair, and confidence in himself.

Richard L. Reece, M.D.
Editor in Chief



Everyone's talking
about helping patients
understand their
prescription medication...

with your help,
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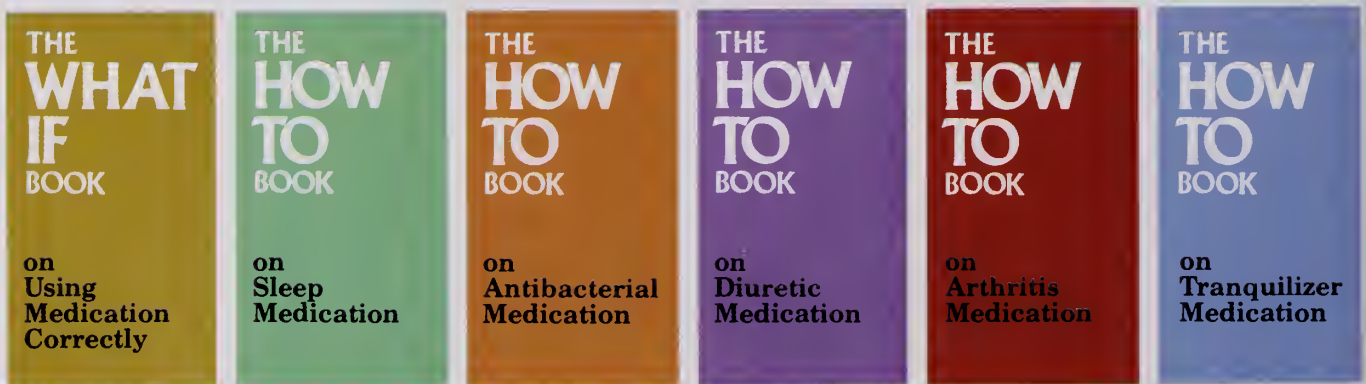
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Health Care Equity†

THOMAS A. LOVE, M.D.*

The great majority of western countries have opted for a public utility form of medical care delivery. The United States has been threatened with a change from its diverse multi-faceted private-enterprise delivery system towards a socialized public utility status, but the American populace and the health care profession and industry have not deemed it wise nor necessary to totally convert.

American society is rapidly nearing, or has already reached, the point where it is unwilling to commit the level of resources to health care that it has during the past 25 years. Last year the U.S. health care spending hit \$285 billion, nearly 10% of the gross national product. Hospital bills, doctors' fees, medicine, tests, long term care, ancillary services, insurance profits, government regulations and all the rest cost each man, woman, and child about \$1200 a year.

Not everyone agrees that is too much to spend. Some think good health is well worth the price. The health care industry is in a growth phase and the money might better be spent there than on gambling, stimulants, defense, or whatever else requires a portion of the national pie. But a growing number of doctors, economists, and experts think there is a limit to the amount the U.S. can spend on the infirmities of its people. They say the time has come to think about where to draw the line. Health policy analysts have suggested that there are two pathways toward a more sparing use of social resources for health care that might be better than succumbing to the public utility solutions of other western countries: increased regulations or increased competition. Past regulatory efforts seem to have failed, and most commentators seem increasingly dubious about the ability of government to produce economies needed.

The competition advocated is not the intense competition already existent in the medical market place, but the competition between health insurance systems. Included are many possible variations upon the HMO, which have been touted as making more efficient use of health services. Studies to date do not seem to indicate a cost saving to the system from these alternative health care plans.

Most of the focus of the health policy debate over competition has been upon the insurance system, not on the physicians, hospitals, nursing homes, and other actors who deliver health care.

The government, labor movement, and industry, as purchasers of care, have promoted this new thrust of competition, but major problem areas have not been given adequate thought or analysis. Unfortunately, the providers of care will be left with the day to day tasks of working through the changes and problems inherent in any system of change.

1. How will medical education in teaching hospitals be subsidized and sustained in the new competitive delivery system?

2. The free bed care presently provided by many hospitals will cease and desist in a more competitive environment. How will this be replaced?

2. Government and prepaid plans now pay less than the going rate. In a more competitive system hospitals will first seek to fill their beds with profitable patients, and a two-tier system or class system of medical care will be inevitable.

4. A take over of hospitals by large-for-profit corporations will probably ensue, and quality of care will suffer.

Access to quality medical care at a reasonable cost is an imperative we must keep in mind. Access for all and not just the wealthy. We will never be able to achieve equality for all, but we must continually work to minimize inequality.

Unfortunately for the system which has produced the best quality of care and health technology in the world, the next decade will see a tearing apart of our past efforts achieved by professionals acting as advocates for their patients and hospitals providing the epitome of caring with their health facilities. We have already witnessed doctors becoming more organized with larger group practices and health forces to represent medical interests. Hospitals, responding to the stimulus of decreasing bed utilization, increasing out-patient provisions of services by practitioners and free standing centers, are struggling to fill their institutions by establishing satellite clinic offices, building offices for physicians, hiring more doctors to work for the hospital, thereby competing with other hospitals and physicians in the community.

†Presented at the Hospital Trustee Conference V, October 30, 1982.

*Chairman of the Physicians' Metro Health Force which is a regional physicians group organized to provide planned leadership for physicians in the Metro-Twin Cities area.

These struggles and positioning and tactical maneuvers to try and insure a profitable territory and referral network will occupy us all as the most visible evidences of competition. The theme of this conference is the issue of equity. I would like to present my personal thoughts and opinions about what the next decade could produce in this very important but not well discussed issue of trying to assure our patients and fellow citizens of quality health care while the majority of our efforts are being directed at cost containment. I strongly feel, based on extrapolating current trends, that this new trust will result in retrenchments from where we are today, because the costs are just too high. The dilemma, simply stated as I see it, is: controlling medical costs means denying care to people.

Certainly there is ample precedent in other countries for establishing limits on services, and it is not hard to think that it is going to happen here as well. Some feel the U.S. has not reached the point where it can not afford the medical care it provides its citizens. What is wrong with spending 10, 15, or 20 percent of the gross national product on health? Do we have anything better to spend it on? Cars? Television? Football? Cosmetics?

But assuming limits must be set, the hard part is deciding who should get care. Inability to pay or financial needs is one criterion first seen. A second for consideration is the odds they might get better and the likelihood that they will contribute something to society are others less tangible.

By these standards, it could be argued that people over a certain age should not receive extraordinary care. As people get more concerned about how we are going to finance terribly expensive programs, I think they will discover that a lot of money is appropriated to keep people alive who, if offered a nice alternative, might prefer that alternative. Many will still demand the all out care, but education of the young might lead them not to demand heroic treatment when they do get old.

While many sick elderly people might understand the rationale for denial of care, not all expensive patients are elderly. Some are in their first hours of life. The care for premature babies weighing a pound or less can run into hundreds of thousands of dollars for each baby. Is it morally permissible to deny care when the costs are too high? Is it ethical to make life and death decisions based on economic factors? Talking about withholding care is easy; doing it is not. What do you

do with a baby who is living and weighs less than a pound? Do you put it in a corner? No one, no matter how expert, is absolutely sure which patient will survive with good care and which will die regardless of the measures taken. Society will make these decisions by tightening the purse strings or loosening them. The real question society has to decide is: who is going to get a slice of the pie?

Is it the 82-year-old person who is going to get a coronary bypass, or the 45-year-old executive who is going to be on hemodialysis, or the three-day-old newborn who has his whole life ahead of him? If the resources are not there, there is no ethical problem. One's hand is forced. You have to set limits because there really is no choice.

From the perspective of the physician, I think it is fair to summarize that we sense the difficult role and awkward situation those forces pushing the competitive market place in an effort to control health care costs have placed us. We perceive that the large buyers of care are not about to change the problems of first dollar coverage, excessive health care benefits won by the unions, and the lack of copayment and the poor health practices of an excessive number of our fellow citizens. Rather than the politicians taking unpopular stands to change the reimbursement mechanisms and apportionment of the GNP, these promoters of the competitive model have laid the task of controlling health care expenses in the hands of physicians and hospitals.

I have tried briefly to set forth the problems that are not discussed such as: multiple levels of care, rationing, denial of care, and an inevitable diminution of quality. The images of the physicians and hospitals have been maligned and misrepresented and chastised, all in an effort to focus the citizenry on what is perceived as excessive health care costs.

In the next decade when we become more responsible for turning away those that can not afford to get in the hospital or send the indigent to the county hospital or deny dialysis or heroic expensive care to someone, then I submit that public perception, as we know it today, even if it is not what it was ten years ago, would be welcomed with open arms. It seems to me that we face a no win situation and to reiterate: controlling medical costs means denying care to people.

Abdominal Injuries

PETER MUCHA, JR., M.D.*

EXCEPT FOR the solar plexus blow that “knocks the wind out”, internal (abdominal) injuries are relatively uncommon in sports. Still, the potential for serious and even fatal abdominal injuries exists in almost every type of athletic endeavor. Therefore, physicians, coaches, trainers, and other athletic team staff members must be aware of the possible types of abdominal injury that can occur. Early recognition of significant abdominal trauma is essential in ensuring appropriate evaluation and treatment.

Abdominal Anatomy

The contents of the abdominal cavity, as we know,

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are contained by the abdominal wall and side musculature along with the bony support of the lower thoracic rib cage, the spine, and the pelvis (Figure 1). The abdominal area of the body is actually divided into the abdominal cavity and the retroperitoneum (structures behind the abdominal cavity). Any discussion of abdominal injury should also include the organs in the retroperitoneum: the pancreas, a portion of the duodenum (first part of the small intestine), and the kidneys with their collecting tubes (ureters) on each side. The retroperitoneal abdominal aorta and inferior vena cava are the major blood carrying vessels of the abdomen (Figure 2). Injuries to these vessels can be life threatening.

The organs found within the abdominal cavity are basically those involved with digestion. The digestive

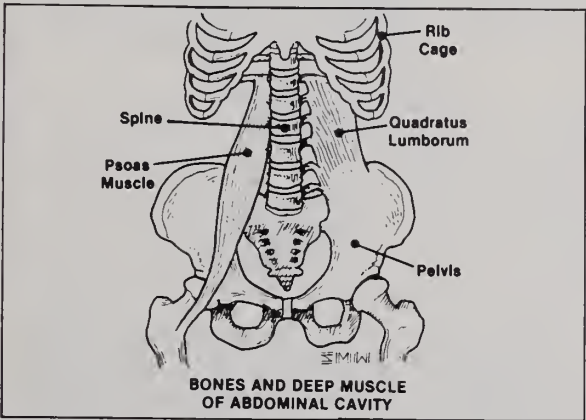


Figure 1

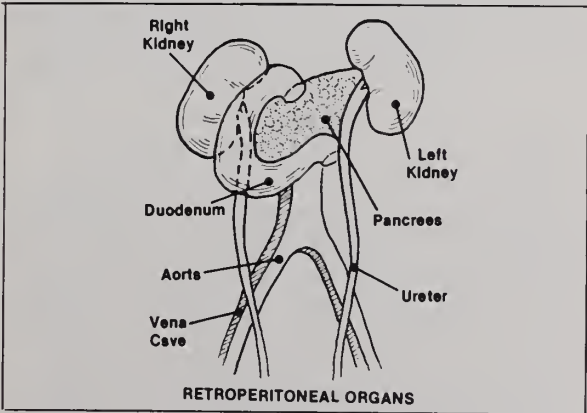


Figure 2

tract is literally an elongated tube with specialized structural modifications along the way. In the abdominal cavity (Figure 3), the digestive tract starts at the diaphragm with the stomach followed by the small intestine, and the colon (large bowel) which eventually ends in the rectum and anus. The gall bladder, bile ducts, and the pancreas drain into the small intestine. These specialized organs produce enzymes important in the digestion of food. The liver in the right upper quadrant of the abdomen, and the spleen in the left upper quadrant, are two large, solid organs which carry on a number of body functions. Their size, location, and solid consistency make them especially prone to injury. The last abdominal organ, the bladder, is part of the urinary system, lies in the lower abdominal cavity and is protected by the bony structure of the pelvis. The bladder functions as the collection bag for the ureters draining the kidneys.

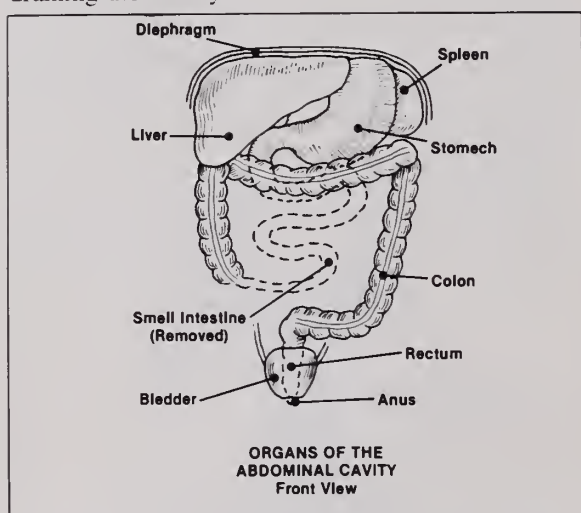


Figure 3

We are all aware that in addition to skeletal support, the abdomen is protected by three well developed muscle masses. These are the rectus abdominus muscle in the front and the internal and external oblique muscles on the flanks (Figure 4). The back of the lower torso is well endowed with three large muscle groups, the erector spinae, quadratus lumborum, and the iliopsoas muscles (Figures 1 & 5). These muscles sustain the brunt of most traumatic injuries.

Of importance in trauma is the fact that the upper extent of the abdominal cavity is controlled by movement of the diaphragm during breathing. With forced breathing out, the liver, spleen, and stomach can be as high as the seventh or eighth rib. The lowest ribs (the tenth through twelfth) lie around the liver, spleen and kidneys. Any injury to the lower ribs (seventh through twelfth) can potentially cause serious injury to these abdominal organs.

Prevention

A well organized preseason and ongoing physical conditioning program is important in protecting the abdominal structures. Exercises aimed at strengthening the abdominal wall musculature include sit ups, back extension exercises, and six inch leg elevations.

Avoiding heavy food consumption prior to any athletic endeavor is also of value in protecting the athlete from abdominal injury. A full stomach is much more prone to injury than if it is empty. The same is true of the colon and bladder. Ideally, these organs should be as empty as possible prior to athletic competition. Urination and/or defecation should be encouraged. The "pre-game jitters" is nature's way of insuring this elimination and readies the participants for the contest.

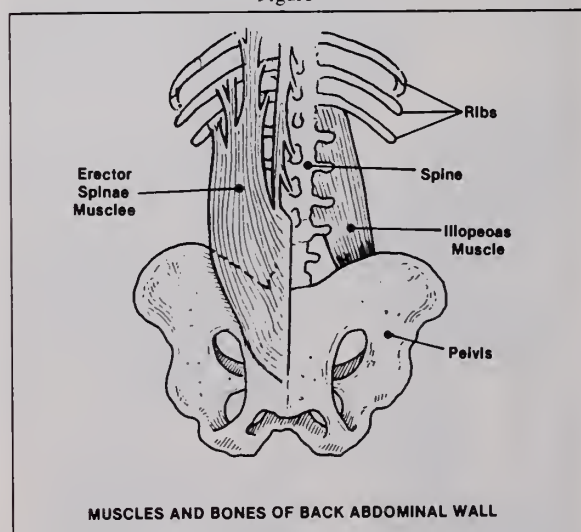
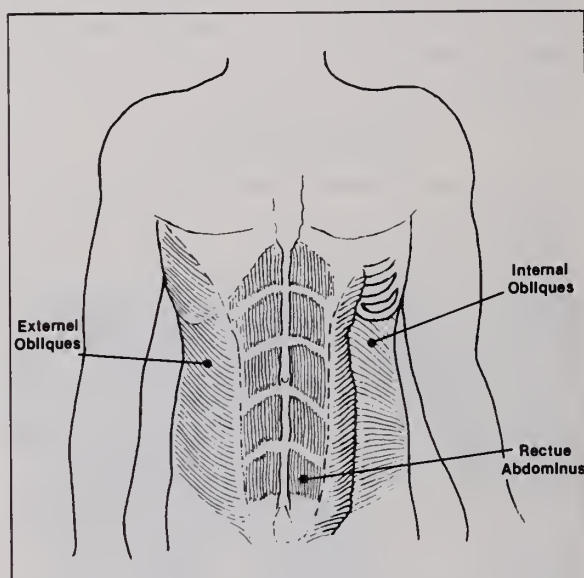


Figure 5

Of particular importance from a preventive standpoint is the responsibility of the coaching staff in instructing amateur athletes on the proper use of equipment. Football and hockey helmets and facemasks have evolved because of their protective value to the head; not as weapons. Use of the helmet or facemask in head-first contact is condemned to avoid serious injury. Similarly, the proper use of other athletic equipment such as hockey and lacrosse sticks, baseball spikes, and forearm pads must be encouraged. Finally, the use of the body itself as a weapon should not be condoned. There has to be a conscious awareness by all coaches and athletes of the possible harm that can result to the other person in throwing elbows, tripping, clipping, grabbing facemasks, and using similar illegal or dangerous tactics.

Specific Injuries

Most athletic injuries are a result of blunt force. A blunt force is delivered in some manner to a given part of the body and in turn the kinetic energy is transmitted to body structures in accordance with the initial force applied. As noted earlier, the well developed abdominal musculature takes the brunt of most of this force and bruises to these muscles are a commonly encountered athletic injury. Initial treatment consists of the application of ice directly to the area of the bruise to prevent any further swelling. It is important to ensure that no abdominal injury has occurred when the abdominal wall has been struck. As a general rule, the solid organs (spleen, liver, and kidneys) are more prone to injury and rupture than are the hollow organs (stomach, intestine, colon, and bladder).

Spleen

The spleen is one of the more common organs injured with blunt abdominal trauma. Rapid, fatal hemorrhage can occur. At the other extreme is the development of a contained pool of blood within the spleen with no external visible sign whatsoever. Sometimes this apparently minor injury presents as a "delayed rupture" caused by the gradual oozing of blood which is at first contained but because of increasing size suddenly bursts freely into the abdominal cavity several days to weeks later. This "delayed rupture" can result in fatal bleeding. Any athlete who has received a blow to the abdomen and who suddenly develops abdominal discomfort on the left side days or even weeks later should be examined by a physician immediately.

Until recently, injury to the spleen necessitated complete removal of this organ because of the

possibility of continued bleeding or rupture. However, it is not known that the spleen is a very important organ in dealing with the body's day to day ability to fight off infection. Individuals who have had their spleens removed for whatever reason are more susceptible to severe infections which can be fatal. Therefore, most surgeons avoid operating on the spleen unless it is absolutely necessary. If surgery is carried out, most surgeons will attempt to repair the spleen rather than remove it. If the spleen is removed, antibiotics or immunizations may be used to prevent serious infections.

When no surgery or repair of the spleen is performed, there are serious implications as far as the athlete's participation in future athletic activities. Due to the injury, avoidance of excessive physical activity and any type of contact sports activity will be necessary for anywhere from four to twelve months.

Infectious mononucleosis makes the spleen highly susceptible to rupture from even the force of light touch. Any person diagnosed as having mononucleosis should be restricted from all contact and exertional activity until written permission is obtained from his/her physician. Persons having colds, flu, or respiratory infections should be examined by a physician to rule out the presence of mononucleosis.

Liver

The liver is the largest abdominal organ and its size probably accounts for the fact that it is frequently injured from blows to the abdomen. The damage from this type of injury may run from simple cuts which require nothing more than observation to the very serious shattering of a lobe of the liver. A shattered lobe is life-threatening and may require surgical removal of a least half to nearly two-thirds of the liver. These "burst" injuries of the liver (and spleen) are rare but when they do occur, they can cause death. Any persistent pain or discomfort in the right upper section of the abdomen should be examined by a physician because of the possibility of a liver injury.

Kidneys

Injuries to the kidneys, ureters, and bladder are the most frequently seen abdominal injury among athletes. However, the majority of these injuries are not severe. The most common symptom/problem is the presence of blood in the urine. This dictates removal of the athlete from any further competition until evaluated by a physician. While a major injury may not require surgery, it will usually require restriction of the individual's athletic activities for several months.

Digestive Tract

Injuries to the stomach, small intestine and colon are extremely rare following blunt trauma. When they do occur, peritonitis takes place and carries with it a significant chance of death or serious complication. Again, it must be emphasized that athletes should avoid heavy pregame meals and be encouraged to eliminate waste in order to empty the stomach, colon, and bladder prior to any athletic contest. When these hollow organs are full they are much more prone to injury.

Miscellaneous

Rare, but occasionally encountered, abdominal injuries include those to the bile ducts draining from the liver into the small intestine, to the pancreas, and to the aorta and vena cava. Injuries to any of these structures will usually have rather dramatic symptoms. Massive internal bleeding and shock are symptoms of injury to the major blood vessels. Persistent pain is a symptom of contamination of the abdominal cavity by biliary, pancreatic and/or intestinal juices.

Recognition of Abdominal Injuries

Any athlete who receives any type of blow or trauma to the abdominal region of the body should be considered as having a potentially serious injury until proven otherwise. This attitude also applies to the commonly encountered solar plexus injury. The first symptoms of solar plexus injury might even be greater than that of a serious abdominal injury.

The solar plexus is a common description of an undefined structure lying within the "pit" of the stomach which really represents a group of nerves meeting in the abdominal area. Any direct blow to the upper portion of the abdominal wall over this "solar plexus" produces a momentary reflex paralysis of the diaphragm. The athlete has his "wind knocked out" and cannot breathe. It usually lasts a short time (seconds); however attention must be directed to ensuring that there is no obstruction to breathing. Obstructions may include a dislodged tooth or denture, or vomit inhaled into the airway. Check for any type of constriction of the neck, chest, or abdomen by clothing or equipment. This entails loosening the belt buckle and any other constricting straps or pads that the player might be wearing. Do not pull or jerk on the belt or apply additional forceful thrusts to the abdomen in order to stimulate respiration. This loss of breath can be a very frightening experience for not only the victim but also for those in attendance. Calm reassurance will allow the victim to relax to the point where breathing

will resume without assistance. Artificial respiration may have to be administered although this would be rare.

After a blow to the abdomen the athlete should be taken to the sidelines and observed closely rather than be returned to the lineup. This rule applies to the most outstanding star performer as well as the third stringer and even if it does mean the difference between victory and defeat. If any abdominal pain or discomfort persists longer than five minutes or is present with mild touching the athlete should be taken to the nearest hospital facility where further evaluation and diagnostic measures can be carried out.

Do not give the athlete anything to eat or drink. If emergency surgery does become necessary, an empty stomach will make the use of anesthesia safer by avoiding the risk of vomiting the stomach contents.

Periodic careful examinations, preferably the same physician, will usually detect any abdominal injury. Aside from the rare occurrence of a delayed rupture of the spleen, the question as to whether or not significant abdominal injury has occurred will be answered within 48-72 hours.

This article outlines an aggressive approach to any athlete who has sustained a possible abdominal injury. However, it is the only way of preventing loss of life or permanent injury in an otherwise correctable situation.

Summary

1. Abdominal injuries can be serious and may even cause death.
2. Exercises that strengthen the muscles around the abdominal cavity can help prevent injuries to the abdominal organs.
3. Avoiding heavy food consumption and emptying the stomach, colon, and bladder will help decrease the chance of injury to these organs.
4. Coaches are responsible for teaching proper use of equipment and safe, legal tactics to avoid all injuries.
5. Any person diagnosed as having mononucleosis should be restricted from all contact and exertional activity.
6. Any athlete who has received a blow to the stomach and develops abdominal discomfort should be examined by a doctor for possible injuries to the abdominal organs.
7. When an athlete has had the "wind knocked out", ensure that the airway is clear but do not pull or jerk on the belt.

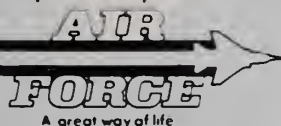
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THE MULTIVITAMIN/MINERAL FORMULATION

History

The School at Alexandria and the Vascular System

The Circulation Near Miss

RAYMOND C. BONNABEAU, JR., M.D. Ph.D.*

THE IONIAN REVOLUTION that started in the Sixth Century B.C. culminated with the scientific marvels associated with the city of Alexandria, constructed fourteen miles west of the mouth of the Nile.

The city was founded in 332 B.C. by Alexander the Great, following the alleged appearance of Homer to him in a dream. Originally, the boundaries were laid out with flour (eaten by birds) and the city then built, Alexander not living to see the finished product.

Alexandria flourished over the next six hundred years through riot and misfortune, attaining its greatest prosperity in the days of the Ptolemies, who made it their capital. Despite all adversity, when the city was finally captured by the Caliph Omar in 640 A.D., it was still formidable, possessing some 4,000 palaces, 4,000 baths, 400 theatres, or places of entertainment, and 12,000 shops.

Its population was wonderfully diverse, counted at 500,000 inhabitants in the 1st century B.C., consisting of a polyglot of Macedonians, Greeks, Romans, Phoenicians, and other nationalities. They all, initially at least, dwelt in relative harmony due to Alexander's respect and toleration for different cultures as well as religions.

The town, besides being constructed in a lavish and open style, contained the Pharos, a huge lighthouse, one of the seven wonders of the ancient world, and eventually Alexander's tomb.

The greatest wonder was the famous library and museum, devoted to the nine muses (hence the name). This museum has been described as the Rockefeller Institute of its day and was due to Alexander's pursuit of and fascination with knowledge, no doubt fostered by his teacher Aristotle. For example, Alexander is supposed to have gone down into the Red Sea in the world's first diving bell. The library (there is virtually nothing left today), at one point held approximately 700,000 volumes prior to its destruction. The scientific institute, dedicated to many disciplines in its prime, contained some of the most illustrious scientific names of all time.

EUCLID (c. 300 B.C.), one of its earliest savants, made it the center of mathematical studies.

ARISTARCHUS (c. 230 B.C.) of Samos, an astronomer of note, believed the sun and not the earth was the center of the universe, an idea that did not gel until Copernicus 1800 years later.

ERATOSTHENES (c. 194 B.C.), who computed the circumference of the earth to within 50 miles of modern calculations.

ARCHIMEDES (c. 212 B.C.), who worked extensively in mechanics.

APOLLONIUS OF PERGA (c. 225 B.C.), the mathematician who described the forms of conic sections (produced by cutting through a cone at a different angle), specifically the ellipse, parabola, and hyperbola.

HERON of Alexandria (c. 50 A.D.), who invented gear trains, steam engines, and wrote a book on robots.

HYPATIA of Alexandria (c. 415 A.D.), a woman astronomer who wrote on the conics of Apollonius. Her light was the last scientific flame, extinguished by a fanatical mob of Christians who set upon her in the street, beat her to death, and burned her body. She and the library and museum were equated with paganism, and both had to be (and were) destroyed for the same reason in the same way.

The Alexandrian school also led the way in medicine in the persons of HEROPHILUS OF CHALCEDON (c. 300 B.C.) and ERASISTRATUS (330-250 B.C.).

It was during the periods of activity of these two men that the workings of the heart and vessels came closest to being understood as they are in reality.

The Heart and Vessels Prior to Alexandria

Aristotle: Noted vessels coming from the heart and connected them together as a system. Due to his method of killing his experimental animals (strangulation) and also because he probably did not excise the heart from the animal, the right atrium and ventricle were engorged with blood and appeared as one cavity. Consequently, the heart to Aristotle had three cavities. He did not notice the valves and there was no distinction made between arteries and veins. The heart

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was the center of innate heat, as well as the intelligence, while air rushed into the heart to cool the innate heat.

The Hippocratic Writing on "The Heart" (c. 260 B.C.)

In this work it was noted that the left ventricle (four chambers were identified) was rougher than the right, due to its being filled with "untempered heat." The A.V. valves, chordae tendineae, and papillary muscles were seen, but no function given. Once again intelligence was placed in the left ventricle. Blood was primarily on the right side, although air was felt to come into the right ventricle from the lungs through a somewhat incompetent pulmonary valve. The left ventricle was cooled from air which entered it from the lungs through the pulmonary veins. The atria were thought of as bellows which sucked air and blood into the heart. A significant advance was made, however, in the recognition of the sigmoid valve on the left side (aortic valve) as a *competent one way valve*. This was proven experimentally by pouring water into the aorta above the valve. No leakage occurred back into the ventricle. As mentioned, the pulmonary (sigmoid) valve was considered to be mildly incompetent. This is the first work where valves are mentioned.

Praxagoras of Cos (340-320 B.C.)

He made the first distinction between artery and veins and made the *discovery* that air or pneuma was contained solely in the arterial system, while blood alone was contained in the right side of the heart and in the veins. The pneuma was replenished by breathing and the pulsation in the arteries (he noted that the veins didn't pulsate) was due to pneuma being moved along.

The Alexandrian School

Herophilus of Chalcedon (300 B.C.)

Noted primarily for his discovery of the nervous system, he described the fact that arteries appeared to be six times as thick as the veins. Consequently, he called the pulmonary artery the *arterial vein* and the pulmonary veins the *venous arteries*. He also felt the contractions and dilatations of the arteries originated in the heart.

All of this preceded ERASISTRATUS (270 B.C.), whom I personally feel came to within a shadow of

discovering the circulation as we know it. One ingredient was initially necessary, and that was supplied at Alexandria by one of his fellow workers, KETSIBIOS, who invented the cylinder, piston, and one-way valve, i.e., he invented the *pump*. Erasistratus correctly interpreted the A.V. valves that he described, (calling them the tricuspid and bicuspid valves), as one-way valves which did not allow backflow. The sigmoid valves did the same. He therefore conceived of the heart as a *true pump*. He had blood, however, flowing only on the right side, while air or pneuma occupied totally the left side and arteries. To explain why blood was found in arteries when they were cut and not pneuma, he explained that pneuma rushed out when the vessel was cut while blood flowed from the veins into the arteries (thus considered a pathological condition), filling the void or vacuum left by the removed pneuma. Thus, there was a circuit formed, albeit in the wrong direction, (at least in the systemic circulation). Two of the ingredients necessary for the circulation discovery were therefore present: (1) the heart as a pump with one-way valves and (2) A connection between the left and right sides through synanastomoses, completing the circuit. In fact he unknowingly had a third also. If his premise were to be tested by cutting the pulmonary veins (venous artery of Herophilus), then pneuma would have escaped and blood would have flowed from the right side through the lungs to the left side, but *in the correct direction*.

All three of these discoveries pointed to a circulation as the mechanics by which blood (and unfortunately pneuma) were distributed to the body.

Had he been able to *quantitate* the blood flow in some way (not done until William Harvey in the 17th Century), he would have been one step closer. Who knows, had he lived longer or if luck had been with him, he might have been able to make the correct conclusions then and there. He had already been involved in metabolic *quantitative* studies and the jump to the circulation, especially in view of his environment and interests, is not inconceivable.

Galen, however, by showing experimentally that blood, not pneuma, resided in the arteries, and the theories he had to generate to explain the heart's actions, destroyed the idea of the organ as a pump until resurrected by Harvey in the 17th Century.

Abdominal Injuries — Mucha, Jr. (page 96)

1. Dolan, JP: Treatment and Prevention of Athletic Injuries. Chapter 7, "The Chest and Abdomen," pp 229-249. The Interstate, Danville, IL, 1955.

2. Litton, LO and Peltier, LF: Athletic Injuries, Chapter 4, Injuries of the Chest and Abdomen. pp 72-85, Little, Brown & Co., Boston, 1963.

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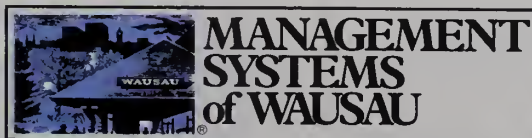
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For assistance with scheduling meetings, please contact the MMA office (address and phone given below) for information on future medical meetings and CME courses at the state and national level.

Information for each entry is arranged as follows: Date: Name of program: Primary sponsor: Location; Contact person.

February, 1983

10-19 Advanced Cardiac Life Support Course; Methodist Hospital, Methodist Hospital; CONTACT: Joan Peterson, R.N., Methodist Hospital, 6500 Excelsior Blvd., P.O. Box 650, Mpls., MN 55440, 612/932-5419.

11 Quarterly Clinical Meeting; Minnesota Dermatological Society; Hennepin County Medical Center; CONTACT: J. Corwin Vance, M.D., Dept. of Dermatology, HCMC, 701 Park Ave. S., Mpls., MN 55415.

15 Psychiatry; St. Joseph's Hospital; St. Joseph's Hospital, Brainerd; CONTACT: M. A. Muesing, M.D., 303 Kingwood, Brainerd, MN 56401, 218/829-3568.

16-17 Drug Therapy Symposium; U of M Medical School; Location Holiday Inn — Nicollet Mall; CONTACT: CME, U of M, Box 293 Mayo Memorial Bldg., 420 Delaware St. SE, Mpls., MN 55455, 612/373-8012.

19-26 Annual Meeting; Minnesota Psychiatric Society; Colorado; CONTACT: Joseph Westermeyer, M.D., Box 393, Mayo Bldg., U of M Hospitals, Mpls., MN 55455.

25-26 ENT Problems/Primary Care; U of M Medical School; Location Sheraton Ritz — Minneapolis; CONTACT: CME, U of M, Box 293 Mayo Memorial Bldg., 420 Delaware St. SE, Mpls., MN 55455, 612-373-8012.

25-26 Interdisciplinary Approach to Treatment of the Critically Ill Patient; St. Paul-Ramsey Medical Center; Radisson Plaza Hotel, St. Paul; CONTACT: Ruth McIntyre, CME, St. Paul-Ramsey Medical Center, 640 Jackson St., St. Paul, MN 55101, 612/221-3992.

25-26 Office Management in Ear, Nose & Throat; U of M; Mpls.; CONTACT: CME, U of M, Box 293 Mayo Memorial Bldg., 420 Delaware St. SE, Mpls., MN 55455, 612/373-8012.

28-March 1 Basic Life Support Course; Methodist Hospital; Methodist Hospital; CONTACT: Janell Haugen, Methodist Hospital, 6500 Excelsior Blvd., P.O. Box 650, Mpls., MN 55440, 612/932-5189.

28 and March 1 Basic Life Support Recertification Course; Methodist Hospital; Methodist Hospital; CONTACT: Janell Haugen, Methodist Hospital, 6500 Excelsior Blvd., P.O. Box 650, Mpls., MN 55440, 612/932-5189.

March, 1983

3-5 Clinical Therapeutics — 1983; St. Paul-Ramsey Medical Center; Radisson Plaza Hotel, St. Paul; CONTACT: Ruth McIntyre, St. Paul-Ramsey Medical Center, 640 Jackson St., St. Paul, MN 55101, 612/221-3992.

16 Rheumatology; St. Joseph's Hospital, Brainerd; CONTACT: M.A. Meusing, M.D., 303 Kingwood, Brainerd, MN 56401, 218/829-3568.

16-26 Caribbean Air/Sea Cruise; North Central Medical Conference CME included. CONTACT: Karen Tourdot, Minnesota Medical Association, 2221 Univ. Ave., Minneapolis, MN 55414, 612/378-1875.

17-19 Cardiopulmonary Medicine, 1983; St. Paul-Ramsey Medical Center; St. Paul; CONTACT: Ruth McIntyre, St. Paul-Ramsey Medical Center, 640 Jackson St., St. Paul, MN 55101, 612/221-3992.

18 Difficult Treatment Problems Facing Physicians in Family Practice; Duluth Clinic; St. Mary's Hospital; CONTACT: J. G. Brueggemann, M.D., Duluth Clinic Ltd, 400 E. 3rd St., Duluth, MN 55805, 218/722-8364.

19 4th Annual Update Occupational and Environmental Pulmonary Diseases; Midwest Center for Occupational Health & Safety; St. Paul; CONTACT: Ruth McIntyre, St. Paul-Ramsey Medical Center, 640 Jackson St., St. Paul, MN 55101, 612/221-3992.

24-25 Ob/Gyn Update, 1983; St. Paul-Ramsey Medical Center; St. Paul; CONTACT: Ruth McIntyre, St. Paul-Ramsey Medical Center, 640 Jackson St., St. Paul, MN 55101, 612/221-3992.

30-April 6, 7 Basic Life Support Instructor Program; Methodist Hospital; Methodist Hospital; CONTACT: Mary Ann Kempcke, Methodist Hospital, 6500 Excelsior Blvd., P.O. Box 650, Mpls., MN 55440, 612/932-5167.

April, 1983

4-5 Colorectal/Primary Care; U of M Medical School; Hyatt Regency, Minneapolis; CONTACT: CME, U of M, Box 293, Mayo Memorial Bldg., 420 Delaware St. SE, Minneapolis, MN 55455, 612/373-8012.

6-7 Behavioral Medicine; U of M Medical School; Coffman Memorial Union Theater, Mpls., CONTACT: CME, U of M, Box 293 Mayo Memorial Bldg., 420 Delaware St. SE, Minneapolis, MN 55455, 612/373-8012.

13-15 Annual Spring Refresher; Minnesota Academy of Family Physicians; Radisson South, Bloomington; CONTACT: Chari Konerza, MN Academy of Family Physicians, 2221 Univ. Ave. SE, Suite 426, Minneapolis, MN 55414, 612/623-9559.

14-15 Pediatric Days; American Academy of Pediatrics, MN Chapter; Rochester; CONTACT: Tony Smithson, Mayo Clinic, E 9A, Rochester, MN 55905, 507/284-2511.

16 Spring Meeting; Minnesota Society of Anesthesiologists; CONTACT: David E. Byer, M.D., 200 1st St. S.W., Rochester, MN 55901

April 1983 (continued)

16 Management of Diabetes Mellitus — 1983; Mount Sinai Hospital; Mpls.; CONTACT: Evelyn Peterson, Mount Sinai Hospital, 2215 Park Avenue, Mpls., MN 55404.

21-23 Allergy and Immunology; U of M Medical School; Mayo Memorial Auditorium, Minneapolis; CONTACT: CME, U of M, Box 293, Mayo Memorial Bldg., 420 Delaware St. SE, Minneapolis, MN 55455, 612/373-8012.

22 11th Annual Pediatric Challenges for Primary Care Physicians; Mpls. Children's Health Center; MCHC; CONTACT: James Moore, M.D., Indian Health Board, 2495 — 18th Ave. So., Minneapolis, MN 55404, 612/721-7425.

23 Spring Meeting; Minnesota Urological Society; Minneapolis; CONTACT: Robert P. Myers, M.D., Dept. of Urology E 17A, Mayo Clinic, Rochester, MN 55905.

25-26 Vitreo-Retinal Disease; U of M Medical School; Holiday Inn, Minneapolis; CONTACT: CME, U of M, Box 293, Mayo Memorial Bldg., 420 Delaware St. SE, Minneapolis, MN 55455, 612/373-8012.

29-30 Disability Evaluation; U of M; Mpls.; CONTACT: CME, U of M, Box 293 Mayo Memorial Bldg., 420 Delaware St. S.E., Minneapolis, MN 55455, 612/373-8012.

May, 1983

2-6 Family Practice Review and Update; U of M Medical School; Radisson Hotel, St. Paul; CONTACT: CME, U of M, Box 293, Mayo Memorial Bldg., 420 Delaware St. SE, Mpls., MN 55455, 612/373-8012.

12 Medicine; St. Joseph's Hospital; St. Joseph's Hospital; CONTACT: M. A. Muesing, M.D., 303 Kingwood, Brainerd, MN 56401, 218/829-3568.

12-21 Advanced Cardiac Life Support Course; Methodist Hospital; Methodist Hospital; CONTACT: Joan Peterson, R.N., Methodist Hospital, 6500 Excelsior Blvd., P.O. Box 650, Mpls., MN 55440, 612/932-5419.

13 Quarterly Clinical Meeting; Minnesota Dermatological Society, Minneapolis; CONTACT: J. Corwin Vance, M.D., Dept. of Dermatology, HCMC, 701 Park Ave. S., Minneapolis, MN 55415.

13-15 State-of-the-Art in Clinical Anesthesiology; Rochester; CONTACT: David E. Byer, M.D., 200 1st St. SW, Rochester, MN 55905, 507/286-8701.

16-17 Topics and Advances in Pediatrics; U of M Medical School; Location undetermined; CONTACT: CME, U of M, Box 293, Mayo Memorial Bldg., 420 Delaware St. SE, Minneapolis, MN 55455, 612/373-8012.

19-20 1983 Scientific Program; Minnesota Medical Association; Minneapolis; CONTACT: Eugenia C. Kassar, Minnesota Medical Association, 2221 University Ave. SE, Suite 400, Minneapolis, MN 55414, 612/378-1875.

23-24 Basic Life Support Course; Methodist Hospital, Methodist Hospital; CONTACT: Janell Haugen, Methodist Hospital, 6500 Excelsior Blvd., P.O. Box 650, Mpls., MN 55440, 612/932-5189.

23-24 Congenital Heart Disease; U of M; Mpls.; CONTACT: CME, U of M, Box 293 Mayo Memorial Bldg., 420 Delaware St. SE, Mpls., MN 55455, 612/373-8012.

25-27 Real Time Ultrasound in Ob-Gyn; U of M; Mpls.; CONTACT: CME, U of M, Box 293 Mayo Memorial Bldg., 420 Delaware St. S.E., Minneapolis, MN 55455, 612/373-8012.

25-27 Current Concepts in Radiation Therapy; U of M; Minneapolis; CONTACT: CME, U of M, Box 293 Mayo Memorial Bldg., 420 Delaware St. S.E., Minneapolis, MN, 55455, 612/373-8012.

27 Cardiovascular Disease; U of M; Minneapolis; CONTACT: CME, U of M, Box 293 Mayo Memorial Bldg., 420 Delaware St. S.E., Minneapolis, MN 55455, 612/373-8012.

29-June 11 Dutch Waterways Adventure; North Central Medical Conference; CME included; CONTACT: Betty Schmid, North Central Medical Conference, 2221 Univ. Ave. S.E., Suite 400, Minneapolis, MN 55414, 612/378-1875.

June, 1983

3,4,5 Annual Meeting; Minnesota Thoracic Society; Location undetermined; CONTACT: Fred Rasp, M.D., 606 24th Ave. So., Suite 119, Mpls., MN 55454, 612/333-2156.

3-5 Annual Meeting; Minnesota Thoracic Society; Madden Lodge, Brainerd; CONTACT: Fred Rasp, M.D., 606 24th Ave. So., Suite 119, Minneapolis, MN 55454, 612/333-2156.

9-11 Interdisciplinary Approach to the Treatment of the Critically Ill Patient; St. Paul-Ramsey Medical Center; St. Paul Hotel; CONTACT: Ruth McIntyre, St. Paul-Ramsey Medical Center, 640 Jackson St., St. Paul, MN 55101, 612/221-3992.

10-11 Annual Meeting; Minnesota Obstetrical & Gynecological Society; Barker's Island, Superior, Wisconsin; CONTACT: Mrs. Cammy Kelley or Dr. Carolyn B. Coulam, Mayo Clinic, 200 1st St. SW, Rochester, MN 55905.

10-11 Clinical Hypnosis; U of M Medical School; U of M, St. Paul; CONTACT: CME, U of M, Box 293, Mayo Memorial Bldg., 420 Delaware St. SE, Mpls., MN 55455 612/373-8012.

14, 21, 22 Basic Life Support Instructor Program; Methodist Hospital, Methodist Hospital; CONTACT: Mary Ann Kempcke, Methodist Hospital, 6500 Excelsior Blvd., P.O. Box 650, Mpls., MN 55440, 612/932-5167.

15-18 G.I. Surgery; U of M Medical School; Willey Hall West Bank, U of M, Mpls.; CONTACT: CME, U of M, Box 293, Mayo Memorial Bldg., 420 Delaware St. SE, Mpls., MN 55455, 612/373-8012.

23-25 Behavioral Pediatrics; U of M Medical School; U of M, St. Paul; CONTACT: CME, U of M, Box 293, Mayo Memorial Bldg., 420 Delaware St. SE, Mpls., MN 55455, 612/373-8012.

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Plasma Cholesterol and Triglyceride Levels in 1351 Children, Ages 10-19, Living in Richfield, Minnesota

IVAN D. FRANTZ, JR., M.D.*, EMILY A. DAWSON, B.S.*, KANTA KUBA, M.S.*, and DONALD B. HUNNINGHAKE, M.D.*

The results of plasma cholesterol and triglyceride measurements for the children participating in the Minnesota Lipid Research Clinic's hyperlipoproteinemia prevalence study are reported. For boys, cholesterol concentrations fell between age 11 and 13, and remained at the lower level until age 18. Triglycerides rose gradually between ages 12 and 19. Age effects were much less prominent for girls. Tables are presented to permit prediction of the effect of weight changes on lipid concentrations for children in this age group.

FROM MAY, 1973, through April, 1974, the Minnesota Lipid Research Clinic conducted a survey of selected census tracts in Richfield, Minnesota, to determine the prevalence of the various types of hyperlipoproteinemia in that population. This survey was part of a collaborative study in which 10 centers participated. In Minnesota, an attempt was made to screen every person aged 10-59 in the defined area. Results of the complete study, including lipoprotein measurements made at a follow-up visit, will be reported later. In the present paper, cholesterol and triglyceride values are reported for children aged 10-19. These values are of interest, in view of recent reports on children in other geographic localities¹⁻⁶.

Laboratory Methods

Cholesterol and triglyceride analyses were performed on an Autoanalyzer II, in accordance with the Lipid Research Clinics protocol⁷.

Recruitment

Experienced interviewers visited every house in the defined area and invited all members of the household in the specified age range to visit the clinic. At this visit, extensive information was obtained, and a fasting blood sample was drawn, with EDTA as the anticoagulant. A consent form, approved by the University of Minnesota Clinical Research Committee, was signed by persons 18 years or over, and by the parents of the younger children.

Table 1 shows the target population, with the

*Department of Medicine, University of Minnesota, Minneapolis.

This work was supported by National Heart, Lung, and Blood Institute, contract number NO1 HV 2-2915-L.

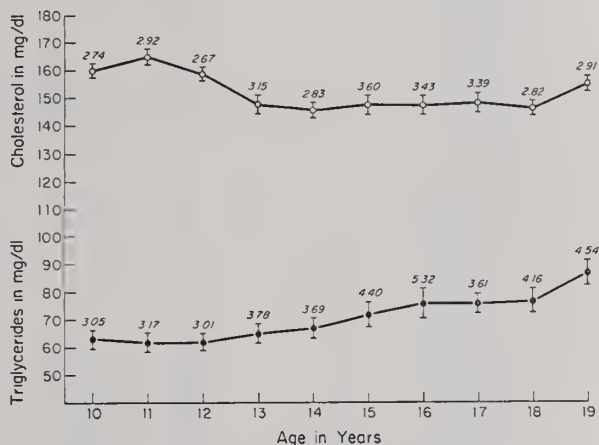


Fig 1 — Mean plasma lipids in mg/dl and standard errors of the means for boys.

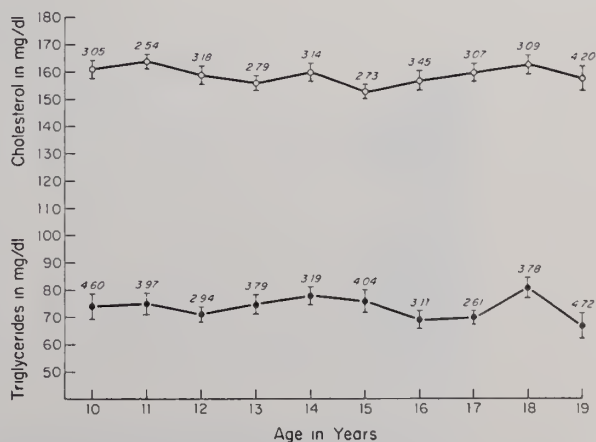


Fig 2 — Mean plasma lipids in mg/dl and standard errors of the means for girls.

numbers screened at each year of age, and the numbers included in the present analysis. Only white children are included, because of the extremely small number of members of other races. Other reasons for exclusion were the taking of medications, suspected pregnancy, non-fasting, and missing lipid data. Table 2 shows the numbers of exclusions, by reason, age, and sex.

Results

Tables 3 and 4 show plasma cholesterol and triglyceride mean concentrations, respectively, by age and sex. Percentiles for the same data are presented in Tables 5 and 6. Means and standard errors by age for boys are plotted in Figure 1, and for girls in Figure 2.

Perhaps the most interesting feature of these results is the definite fall in the boys' cholesterol concentrations between age 11 and 13. The lower level is maintained until age 18, after which there is a rise. The concentration of triglycerides, on the other hand, shows a gradual rise between ages 12 and 19.

For girls, the level of triglycerides shows no significant change between ages 10 and 19. Changes in cholesterol in these ages, while marginally significant, are small.

Table 7 shows mean body mass index by age and sex for our population, and predicted change in plasma lipid concentrations for unit change in body mass index, calculated from the data of Jacobs et al⁸.

TABLE 1
Target Population — Age in Years

	10	11	12	13	14	15	16	17	18	19	Total	10-17 ¹ Total
White Boys												
Target Population	99	101	91	79	98	81	96	109	106	105	965	754
Screened at V1	70	76	79	69	83	65	78	74	81	78	753	594
Not Excluded	68	75	73	64	79	56	69	62	64	69	679	546
% Screened	70.7	75.2	86.8	87.3	84.7	80.2	81.3	67.9	76.4	74.3	78.0	78.8
% Screened Not Excluded	97.1	98.7	92.4	92.8	95.2	86.2	88.5	83.8	79.0	88.5	90.2	91.9
White Girls												
Target Population	82	72	97	102	105	103	107	96	119	114	997	764
Screened at V1	57	64	77	84	85	92	82	87	96	72	796	628
Not Excluded	52	58	68	79	79	82	68	73	72	41	672	559
% Screened	69.5	88.9	79.4	82.4	81.0	89.3	76.6	90.6	80.7	63.2	79.8	82.2
% Screened Not Excluded	91.2	90.6	88.3	94.0	92.9	89.1	82.9	83.9	75.0	56.9	84.4	89.0
Total White												
Target Population	181	173	188	181	203	184	203	205	225	219	1962	1518
Screened at V1	127	140	156	153	168	157	160	161	177	150	1549	1222
Not Excluded	120	133	141	143	158	138	137	135	136	110	1351	1105
% Screened	70.2	80.9	83.0	84.5	82.8	85.3	78.8	78.5	78.7	68.5	79.0	80.5
% Screened Not Excluded	94.5	95.0	90.4	93.5	94.0	87.9	85.6	83.9	76.8	73.3	87.2	90.4

¹Included for comparison with data of Morrison et al² and deGroot et al³.

TABLE 2
Exclusions — Age in Years

	10	11	12	13	14	15	16	17	18	19	Total
Boys											
Non-white	2	1	1	1	1	1	2	0	2	0	11 ¹
Medications	0	0	0	0	0	0	0	0	1	0	1 ²
Non-fasting	2	1	6	5	4	9	9	12	16	9	73 ³
TOTAL	4	2	7	6	5	10	11	12	19	9	85
Girls											
Non-white	2	1	2	0	0	2	0	0	1	0	8 ¹
Medications	0	1	0	0	2	2	3	9	20	23	60 ²
Non-fasting	3	4	8	5	4	8	9	4	3	6	54 ³
Pregnant	0	0	0	0	0	0	2	1	1	2	6
Missing Lipid Data	2	1	1	0	0	0	0	0	0	0	4
TOTAL	7	7	11	5	6	12	14	14	25	31	132
GRAND TOTAL	11	9	18	11	11	22	25	26	44	40	217

¹For boys, 5 are black, 3 are oriental, and 3 are other. For girls, 3 are black, 2 are oriental, 1 is American Indian, and 2 are other.

²For boys, 1 is for high blood sugar medication. For girls, 4 are for high blood sugar medication.

³For 127 non-fasting persons, 62 were fasting for 11 hours, 37 for 10, 12 for 9, and 8 for 8 — 93.7 percent. The remaining 8 persons were fasting for 5 or less hours.

TABLE 3

Plasma Cholesterol Concentrations by Age and Sex

White Boys					White Girls				
Age (Years)	N	X mg/dl	SD	Range	Age (Years)	N	X mg/dl	SD	Range
10	68	160	22.4	120-236	10	52	161	21.8	106-234
11	75	165	25.2	91-222	11	58	164	19.2	117-217
12	73	159	22.7	118-219	12	68	159	26.0	112-263
13	64	148	25.0	103-232	13	79	156	24.6	101-236
14	79	146	25.0	81-205	14	79	160	27.8	103-242
15	56	148	26.7	95-214	15	82	153	24.6	103-231
16	69	148	28.3	94-247	16	68	157	28.2	95-289
17	62	149	26.5	106-221	17	73	160	26.0	107-226
18	64	147	22.4	96-212	18	72	163	26.0	87-235
19	69	156	24.0	111-233	19	41	158	26.6	111-231
TOTAL	679	153	25.7	81-247	TOTAL	672	159	25.6	87-289

TABLE 4

Plasma Triglyceride Concentrations by Age and Sex

White Boys					White Girls				
Age (Years)	N	X mg/dl	SD	Range	Age (Years)	N	X mg/dl	SD	Range
10	68	63	25.0	23-133	10	52	74	32.9	29-207
11	75	62	27.2	27-154	11	58	75	30.0	21-166
12	73	62	25.6	23-132	12	68	71	24.1	30-134
13	64	65	30.0	25-199	13	79	75	33.5	29-265
14	79	67	32.6	17-211	14	79	78	28.2	28-182
15	56	72	32.7	31-215	15	82	76	36.4	35-342
16	69	76	43.8	40-334	16	68	69	25.5	30-139
17	62	76	28.2	30-165	17	73	70	22.1	34-137
18	64	77	33.0	36-206	18	72	81	31.8	22-194
19	69	87	37.4	35-185	19	41	67	29.9	21-197
TOTAL	679	70	33.0	17-334	TOTAL	672	74	30.1	21-342

TABLE 5

Plasma Cholesterol Concentrations: Percentiles

White Boys						White Girls					
Age (Years)	Percentile					Age (Years)	Percentile				
	5th	10th	50th	90th	95th		5th	10th	50th	90th	95th
10	126	138	155	194	202	10	129	135	160	186	189
11	133	136	163	201	217	11	137	141	162	189	197
12	126	133	157	193	205	12	124	131	153	191	204
13	115	119	140	176	194	13	121	128	152	190	211
14	101	112	149	176	187	14	119	125	158	198	218
15	104	115	145	186	207	15	118	121	149	184	198
16	113	116	147	178	203	16	124	130	153	193	200
17	113	120	142	183	199	17	123	129	158	192	213
18	118	121	142	175	181	18	122	135	161	195	210
19	120	128	156	186	196	19	122	126	155	193	211

Discussion

Our results are in general agreement with those of several other recent studies. Table 8 shows a few selected values from Rochester¹, Minnesota, and from Cincinnati³ and Bogalusa², for comparison. The similarity of these results, from widely separated geographical areas, may reflect the success of the laboratory standardization program operated by Dr.

Gerald Cooper at the Center for Disease Control in Atlanta. In all four studies, the fall in blood cholesterol in children after the age of 10 is apparent. At least three earlier reports also noted this phenomenon⁹⁻¹¹, and it is apparent in the combined data from all seven of the North American Lipid Research Clinics Prevalence Studies in which children were included in the target populations^{12,13}.

TABLE 6
Plasma Triglyceride Concentrations: Percentiles

White Boys						White Girls					
Age (Years)	Percentile					Age (Years)	Percentile				
	5th	10th	50th	90th	95th		5th	10th	50th	90th	95th
10	38	40	54	102	116	10	40	44	66	122	143
11	31	35	55	100	120	11	33	42	68	119	129
12	30	33	55	99	116	12	33	39	69	103	114
13	33	39	58	91	102	13	39	46	69	107	139
14	33	40	59	102	134	14	44	51	70	112	136
15	35	40	67	102	132	15	42	48	69	103	109
16	42	43	65	111	133	16	36	42	63	112	124
17	39	44	72	113	127	17	39	43	67	99	110
18	39	42	67	118	154	18	41	48	73	114	156
19	46	46	78	145	173	19	39	40	61	92	123

TABLE 7
Mean Body Mass Index (BMI)¹ and Standard Errors for Boys and Girls, Age 10-19, and Predicted Changes in Cholesterol and Triglycerides (mg/dl) for a Change in BMI of One Unit

Boys						Girls					
Age (Years)	N ²	Change				N ²	Change				
		X BMI	S.E. BMI	CH (mg/dl)	TG (mg/dl)		X BMI	S.E. BMI	CH (mg/dl)	TG (mg/dl)	
10	52	17.30	0.34	0.3	2.5	46	17.27	0.38			
11	55	17.79	0.37	0.5	2.7	50	18.28	0.45			
12	56	18.16	0.34	0.8	3.0	55	18.83	0.37			
13	48	18.84	0.31	1.0	3.2	62	19.73	0.34			
14	61	20.27	0.38	1.2	3.4	67	20.26	0.46			
15	40	20.35	0.39	1.5	3.7	71	20.67	0.37			
16	57	21.43	0.60	1.7	3.9	55	20.66	0.38			
17	50	22.09	0.41	1.9	4.1	63	21.93	0.36			
18	53	22.13	0.49	2.1	4.3	52	21.47	0.46			
19	58	22.47	0.32	2.4	4.6	31	22.03	0.71			
										All Ages 0.7	All Ages 1.4

¹BMI = weight in kilograms
(height in meters)²

²80% of the total children (1351) had the measurements for height and weight necessary to calculate BMI's.

TABLE 8
Plasma Cholesterol and Triglyceride Concentrations by Age and Sex in Four Clinics (Minneapolis (M), Bogalusa (B), Cincinnati (C), and Rochester (R))
Mean Plasma Cholesterol, mg/dl

Age (Years)	Boys				Girls			
	M	B	C	R	M	B	C	R
6	—	167.5	159	158	—	160.9	165	166
10	160	162.5	160	168	161	162.4	164	164
14	146	150.6	154	152	160	151.7	157	158
Mean Triglycerides, mg/dl								
6	—	64.1	55	53	—	66.5	58	48
10	63	69.2	58	50	74	80.8	64	60
14	67	78.2	78	64	78	83.3	82	70

Jacobs et al⁸ have carried out a statistical analysis of plasma cholesterol and triglyceride concentrations in the young participants in this study through age 24. They have shown that much of the relationship in males of blood triglyceride levels to age can be accounted for by change in the body mass index; postpubertal elevations in body mass index in both sexes were also associated with higher levels of blood cholesterol.

These results provide the clinician with the data necessary for identification of children of various ages whose lipid levels are outside the usual range. Before Table 5 or 6 is entered to determine if a child's plasma cholesterol or triglyceride concentration falls above the ninetieth or ninety-fifth percentile, the child's values may be corrected by means of Table 7 to the expected values if his body mass index were average for his age and sex. Table 7 may also be used to determine the expected change in lipid values, if the child were to lose various amounts of weight. The degree to which

lipid levels in childhood are predictive of levels in later life has not been adequately studied, and the value of lipid lowering regimens in slowing the progression of atherosclerosis is also controversial. In our opinion, a child whose lipid values are above the 95th percentile merits close observation. Secondary forms of hyperlipoproteinemia should be ruled out, and the family should be investigated. If the elevation persists, the institution of a lipid lowering diet and reduction of obesity is justified. If the elevation is severe, in the opinion of the authors, the addition of lipid lowering drugs is in order.

The advice to keep blood lipids low currently depends more on epidemiological findings than on firm experimental evidence. And yet the best chance to reduce the incidence of coronary heart disease in the developed countries may very well lie in the adoption of a diet low in cholesterol and saturated fats, beginning in childhood.

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COVER PHOTOGRAPH

"Palenque, A Mayan Ruin"

Palenque is regarded as one of the most lyrically beautiful Mayan ruins, located approximately 70 miles southeast of the Mexican isthmus city of Villahermosa. The pyramidal structure with the central stairway is the "Temple of the Inscriptions" in which Alberto Ruz Lihuillier discovered in 1949 the ornate tomb of Pascal (a ruler of Palenque) 80 feet below the floor of the temple. The structure on the left is "The Palace." Palenque flourished between 300 and 900 A.D.

Dr. H. B. Roholt, an internist practicing in Bemidji, is the photographer of this beautiful cover. The photograph was taken with a Nikon 35 mm camera with standard lens, and the exposure was determined by in-camera metering.

While he and Mrs. Roholt were on vacation in 1976, Dr. Roholt took the photograph of the ruin. They have made annual trips to Central America since 1976 visiting the Mayan ruins throughout this area. Dr. Roholt told the editors it is a fascinating area, and he hopes others will journey into it.

In addition to traveling, Dr. Roholt enjoys scuba diving and fishing.

Retrospective Ultrastructural Study of Three Thymic Neoplasms associated with Cushing's Syndrome

Evidence of their Neuroendocrine Nature

MARK R. WICK, M.D.*, ROBERT C. BAHN, M.D.† and DONALD A. SCHOLZ, M.D.‡

Three thymic neoplasms, previously reported as "thymomas" associated with Cushing's syndrome, were studied retrospectively by electron microscopy. One was studied with an immunoperoxidase staining technique for ACTH (adrenocorticotrophic hormone) as well. Neurosecretory granules were found in the cytoplasm of all three tumors, supporting the current concept that these neoplasms are derived from APUD (capable of Amine Precursor Uptake and Decarboxylation), or more specifically, ACTH-producing, neuroendocrine, cells of origin. The immunoperoxidase stain confirmed the presence of ACTH within the tumor cells in the case which was studied by this method.

FOLLOWING THE INITIAL observation by Leyton, Turnbull, and Bratton in 1931¹, multiple cases have since been reported of thymic tumors associated with Cushing's syndrome.^{2,3} These were termed "thymomas" until 1972, when Rosai and Higa proposed the currently used diagnostic label — carcinoid tumor of the thymus.⁴ They and other authors have stated their belief that all "thymomas" seen in patients with this clinical setting are of ACTH-producing, neuroendocrine cellular origin, and are thus capable of paraendocrine function.⁵ Hence, the carcinoid tumor of the thymus has been assigned nosologically to the APUD neoplasms, capable of amine precursor uptake and decarboxylation.

Tissue from the majority of previously reported cases of thymic tumors associated with Cushing's syndrome is unavailable for sophisticated re-evaluation. However, we have been able to obtain specimens for electron microscopy from three of these patients seen at the Mayo Clinic whose cases were reviewed in 1959.⁶ This study will delineate the ultrastructural characteristics of these tumors with a brief review of the clinical and laboratory findings in these cases.

Methods

Histologic sections of 3 thymic tumors found in

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patients with Cushing's syndrome were examined. The paraffin-embedded tissue blocks corresponding to these sections were deparaffinized, and finely-diced specimens of each tumor were placed in 3% phosphate-buffered glutaraldehyde. After postfixation in osmium tetroxide and embedding in epoxy resin, thin sections were cut and stained with uranyl acetate and lead citrate, for electron microscopic examination. The case histories of the three patients were reviewed, and one of the tumors (Case 1) was subjected to study with the immunoperoxidase technique of Sternberger,⁷ utilizing anti-ACTH rabbit antiserum. Positive and negative controls were provided by concurrently stained sections of an unrelated tumor known to contain ACTH, and sections

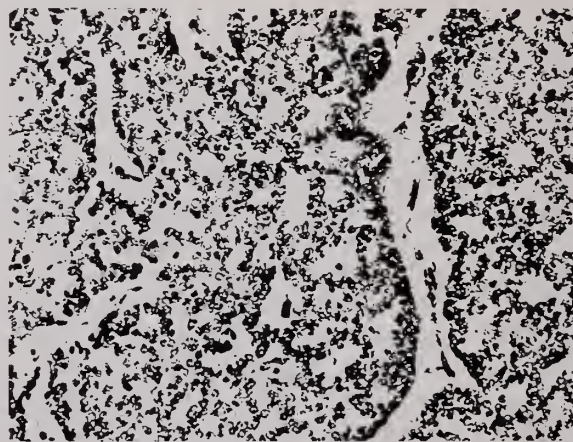


Fig. 1 — Light microscopic appearance of carcinoid tumor of the thymus (Case 1). Small uniform cells are arranged in cords, with an organoid pattern of growth. (Hematoxylin and Eosin, X160)

of the thymic tumor unexposed to rabbit antiserum, respectively.

Results

The light microscopic appearances of each of the 3 tumors were similar, with features of neuroendocrine neoplasms (Figure 1). Ultrastructurally, each contained tumor cells having cytoplasmic dense-core (neurosecretory) granules. These granules varied in size from case to case (100 to 450 nm in diameter), but were of similar dimensions within the cells of any single neoplasm (Figure 2). They were exceedingly abundant in Case 2. Cases 1 and 2 showed a moderate amount of dispersed rough endoplasmic reticulum (RER); mitochondria were not prominent, and desmosomal intercellular attachments were infrequent. The RER of case 3 was abundant, often found in concentric and lamellar arrangements, or "Nebenkerns" (Figure 3); mitochondria were easily found, and desmosomes were rather numerous. Golgi bodies were well-developed in cases 2 and 3, but indistinct in Case 1. Cases 1 and 2 showed nuclei with dispersed chromatin and infrequent, small nucleoli. In contrast, many cells in Case 3 possessed prominent nucleoli, with reticulated nucleonemata (Figure 4). None of the tumors contained tonofilaments, elongated cytoplasmic processes, or basal laminae.

The immunoperoxidase study showed positive staining of the tumor in Case 1, with the anti-ACTH antiserum. This provided evidence that ACTH was indeed present in the cytoplasm of the neoplastic cells.

Case Reports

Case 1

A 39-year-old white woman was referred to the Mayo Clinic in May 1956 with marked ankle edema and bilateral pleural effusions. A diagnosis of Cushing's syndrome had been made elsewhere in 1954, at which time she had undergone right total and left subtotal adrenalectomies. Postoperatively she improved transiently, but then developed generalized pigmentation and weakness, for which she received supportive steroid therapy. In April 1956, she developed effort dyspnea and unexplained dependent edema. Upon examination at the Mayo Clinic she was found to have marked distention of the neck veins. Clinical signs of bilateral pleural effusion were present. The chest roentgenogram confirmed the latter finding, and suggested pericardial effusion and the presence of a mediastinal mass as well. Pericardial paracentesis was performed with removal of 350 cc of serosanguinous fluid. The patient died unexpectedly two days before a planned thoracotomy could be done.

Necropsy disclosed an invasive thymic neoplasm, $8 \times 4 \times 4$ cm, with local involvement of the pericardium and great vessels. No distant metastases were found. The region of the left adrenal contained a small remnant of the gland, which was composed of hypertrophic cortex measuring 2.5 to 3 mm in thickness. Examination of the pituitary showed atrophy of the basophilic cells.

Case 2

A 40 year old white woman with clinical features of advanced

Cushing's syndrome was first seen at the Mayo Clinic in July 1932. Pertinent physical findings included truncal obesity, hirsute facies, and generalized muscle weakness. Significant results of hematologic studies included hyperglycemia, lymphopenia, and hypokalemic alkalosis. Roentgenograms of the skull and chest were interpreted as normal. Because of her severe debility, exploration of the adrenal glands was deferred. Radiation therapy to the pituitary produced a

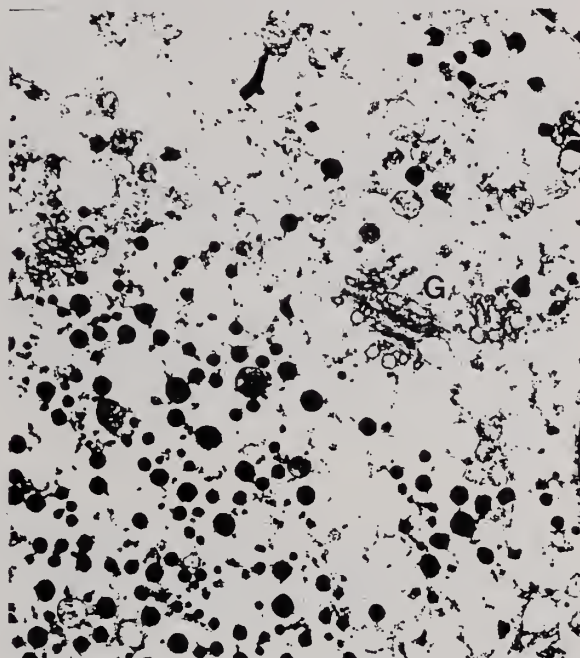


Fig. 2 — Neurosecretory granules found in the cytoplasm of the thymic carcinoid tumor cells (Case 2) by electron microscopy. Note also prominent Golgi complexes (G). (Uranyl acetate and lead citrate, X 20,000)

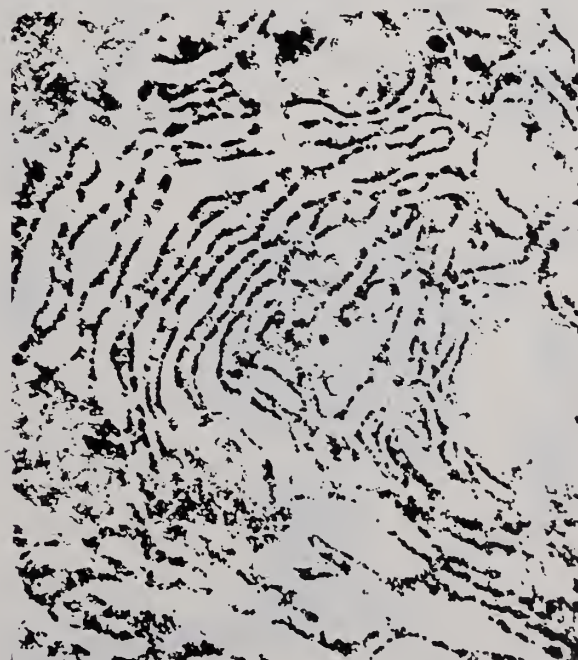


Fig. 3 — Concentric and lamellar arrays of rough endoplasmic reticulum in a carcinoid tumor of the thymus (Case 3). (Uranyl acetate and lead citrate, X 20,000)

brief clinical remission, but she relapsed and died two months after the completion of this therapy.

At autopsy, the adrenal glands were enlarged and hyperplastic, the combined weights being 49 grams. A thymic tumor 3 cm in diameter was found. Atrophy of the basophilic cells of the pituitary was noted, in addition to radiation damage.

Case 3

A 15-year-old white male was referred to the Mayo Clinic in 1948 with a two year history of severe diabetes and clinical features suggestive of Cushing's syndrome. The physical examination revealed many of the classical findings of the latter disorder. The chest roentgenogram appeared normal. The skull radiograph revealed osteoporosis and a normal sella turcica. The 24 hour urine excretion of corticosteroids and 17-ketosteroids were markedly increased. The patient underwent left subtotal adrenalectomy for a markedly hyperplastic gland. A biopsy of the right adrenal likewise revealed adrenocortical hyperplasia and hypertrophy. The weight of the excised glandular tissue was 12.4 g. Death occurred unexpectedly two days postoperatively.

At necropsy, the remaining portion of the left adrenal gland weighed 5 g, and the right gland 29 g. A small tumor totally within the glandular substance of the thymus and measuring $0.5 \times 5 \times 1.5$ cm was found. A chief cell adenoma 0.7 cm in diameter was present in the right inferior parathyroid gland. Bilateral renal calculi were evident. Legal limitations precluded examination of the pituitary gland.

Discussion

The electron microscopic findings in the tumors of these three previously reported cases support the current concept that thymic tumors associated with Cushing's syndrome are not derived from thymic epithelium, but are of specialized neuroendocrine cell origin, structurally resembling carcinoid tumors. The ultrastructural appearance of the three neoplasms we

have reviewed is consistent with the view that a morphologic spectrum exists for thymic carcinoids. Attempts to correlate the electron microscopic features of these cases with clinical tumor function are somewhat speculative, since detailed hormonal studies were not available in all of them. Nevertheless, the final structural aspects of the neoplasms suggest significant synthetic activity, as evidenced by copious, complex RER and numerous mitochondria, or by prominent Golgi bodies and abundant secretory granules. This view is also supported by the presence of severe hypercortisolism clinically evident in each of the three cases. While only one of the neoplasms could be studied by the immunoperoxidase technique for ACTH content, the positive result obtained substantiates the contention that all three thymic tumors were producing this hormone.

In earlier reports, several authors who documented thymic tumors coexisting with Cushing's syndrome were of the opinion (based on limited knowledge then available) that the "thymomas" were probably not of primary importance in the pathogenesis of this disorder.^{8,9} It was even suggested that these tumors might have been a secondary consequence of adrenocortical hyperfunction. It is now well-documented that neuroendocrine neoplasms such as the thymic carcinoid may not only produce ACTH, but may concurrently synthesize multiple other amine and/or peptide hormones, resulting in paraneoplastic endocrinopathies. Following surgical removal of the thymic tumors, clinical remission of Cushing's syndrome has been observed in at least three patients.^{5,10} Interestingly, though the tumors under discussion are termed carcinoids, the carcinoid syndrome has yet to be seen in a patient with a thymic mass of this sort.

The knowledge that on rare occasions patients with thymic carcinoids may be associated with the familial multiple endocrine neoplasia (MEN) syndrome type 1 (tumors of the pituitary, parathyroid, and pancreatic islet cells),^{11,12,13} was useful in followup studies of surviving family members in Case 3. Because of the finding of a parathyroid adenoma discovered in this patient at autopsy, an investigation of the family was undertaken 31 years after the boy's death. This resulted in the previously unsuspected diagnosis of probable Zollinger-Ellison syndrome in one sibling. We are unable, however, to verify that Case 3 indeed represents an example of the MEN type 1 syndrome, since the pancreas was normal, a detailed family history was not available, and the pituitary could not be examined at autopsy. Nevertheless, this case serves to illustrate that families of patients with a carcinoid tumor of the thymus and at least one other endocrine

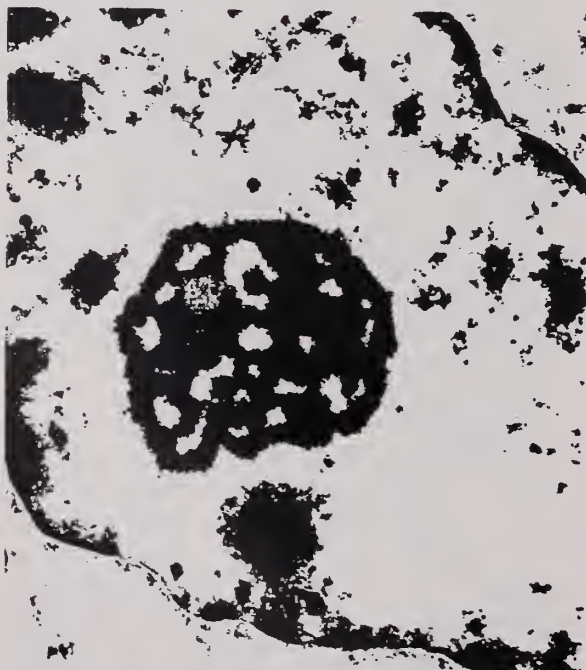


Fig. 4 — Reticulated appearance of the nucleolus in a thymic carcinoid tumor cell (Case 3). (Uranyl acetate and lead citrate, X 20,000).

neoplasm (in the parathyroid, pancreas, or pituitary) should be subjected to careful examination, since such investigation may reveal the presence of unrecognized endocrine tumors.

Cases 2 and 3 exemplify another important point; that is, despite normal chest roentgenograms, a thymic tumor should always be considered as a potential site of

ectopic ACTH secretion in patients with Cushing's syndrome, where appropriate laboratory studies are indicative of this situation. Even today, the diagnosis of these tumors may prove challenging, but the use of a CT scan of the thorax and/or mediastinoscopy may be of benefit in documenting their presence.

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Continuing Medical Information Minnesota Psychiatric Society

The Minnesota Psychiatric Society is sponsoring their annual winter meeting in Vail. Psychiatrists, other physicians, and other mental health professionals are invited.

Topic: Psychiatry in 1983: Review and Update

Dates: February 20 to 25 (arrive February 20, depart February 26)

Time: 7:00-9:00 a.m., 4:00-6:00 p.m.

Registration fees: \$100 (covers welcome wine and cheese, continental breakfast, and afternoon refreshment)

Send to: Joseph Westermeyer, M.D.

Department of Psychiatry

University of Minnesota Hospitals

Minneapolis, Minnesota 55455

University of Minnesota Continuing Medical Education

Treatment of Family Sexual Abuse: Advanced Training Project April 8-22, 1983

Two-week intensive program designed for professionals with experience in the area of family sexual abuse.

Enrollment is limited to 40.

Fee: \$495

Location: Research East Building, 2630 University Avenue Southeast, Minneapolis

For further information contact Diane Campbell, Program in Human Sexuality, Medical School, University of Minnesota, 2630 University Avenue SE, Minneapolis, MN 55414; or phone 612-376-7520.

The Physician As Artist —

An Exhibit of Original Art by Minnesota Physicians

An Exhibit of Original Art by Minnesota Physicians
Sponsored by the Minnesota Medical Association
At Its 1983 Annual Meeting, May 18-20, 1983
Radisson South Hotel, Bloomington

The Annual Meeting Planning Committee for the 1983 MMA Annual Meeting wishes to repeat the physicians' art show. The art show will be open during exhibit hours on Thursday and Friday, May 19-20, 1983.

If you would like the opportunity to exhibit your work to your physician colleagues, please send in the form below *today* so that space can be reserved for your exhibit. We will send more complete information and an official application form in February.

A nominal fee will be charged to defray the cost of security. This can be submitted with the *official application form* to confirm your entry.

Do you know another physician who is an artist? Why not pass along this announcement?

"The Physician as Artist" — Tentative Space Reservation

Please reserve space for me on a tentative basis for an exhibit at "The Physician as Artist", MMA Annual Meeting, May 18-20, 1983, and send further details and an application form.

NAME _____
(Please Print)

ADDRESS _____

OFFICE PHONE _____ HOME PHONE _____

The category of the item I wish to exhibit is:

(Check one — available space will allow only *one entry per individual*)

<input type="checkbox"/> Oils	<input type="checkbox"/> Drawings	<input type="checkbox"/> Ceramics
<input type="checkbox"/> Acrylics	<input type="checkbox"/> Watercolors	<input type="checkbox"/> B/W Photography
<input type="checkbox"/> Sculpture	<input type="checkbox"/> Woodcarvings	<input type="checkbox"/> Colored Photography

Estimated dimensions/size: _____

PLEASE SUBMIT THIS RESERVATION BY *February 15, 1983* SO THAT AN OFFICIAL APPLICATION FORM CAN BE SENT.

Please send to: Dept. of Education & Specialty Affairs, Minnesota Medical Association,
2221 University Avenue S.E. — Suite 400, Minneapolis, Minnesota 55414.

Minnesota Medical Association

1983 MMA Annual Meeting

May 18-20, 1983

(Wednesday-Friday)

Radisson South Hotel, Bloomington

Highlights of the Month

Scientific Program

On **Thursday afternoon** the Scientific Program will once again include a workshop cosponsored by the Minnesota State Orthopedic Society and directed by its president, John Wilson, M.D., Minneapolis. This year's hands-on experience will be unique in that the course has been modified to advance into **Fiberglass Casts: Application Techniques**.

Physicians interested in computers will be able to participate in another workshop **Computers In Your Life: A Hands-on Experience**. This session will be presented by Carlton Erickson, M.D., Lindstrom. Both of the above workshops have **limited attendance so please register early**.

Major environmental and occupational concerns unique to agricultural populations in the Upper Midwest will be addressed in **Farm and Rural Medicine**. This session will be directed by Paul B. Johnson, M.D., St. Paul and jointly sponsored by North Central Chapter, American Occupational Medical Association and Midwest Center for Occupational Health and Safety. Others on the faculty will be from the University of Minnesota as well as the University of Iowa.

Andrew Dean, M.D., Director, Disease Prevention and Control, Minnesota Department of Health, Minneapolis will present **Health Problems of Minnesotans**. This session will tell you where to obtain further information on office-based programs for prevention related to the major health problems of Minnesota (cigarette smoking, alcohol/drug misuse, injuries, nutrition, the environment, stress, physical activity level, hypertension . . .)

New and practical concepts in **infectious diseases** will be presented and discussed by Charles W. Drage, M.D., St. Paul along with Kent Crossley, M.D., St. Paul, Susan Schwartz, M.D., St. Paul, and Robert Tofte, M.D., St. Paul.

Hospital Medical Staff Leadership Conference sponsored by the Minnesota Medical Association in Cooperation with the Minnesota Hospital Association

Saturday, March 26, 1983 8:00 a.m.-3:45 p.m.

Sheraton Midway, St. Paul

The program has been designed to help equip medical staff leadership for developing constructive responses to current forces affecting hospital medical practice, and to promote cooperative approaches among medical staffs, hospital administrators and hospital trustees. Speakers include Joseph F. Boyle, M.D., Chairman, AMA Board of Trustees, Donald Wegmiller, M.H.A., President and Chief Executive Officer, Health Central System and Richard E. YaDeau, M.D., former President and Chairman, Foundation for Health Care Evaluation.

CME Credit: 6 hours in Category 1 of the AMA/PRA

Registration Fee: \$75.00

Contact: Eugenia C. Kassar, Department of Education & Specialty Affairs, Minnesota Medical Association, 2221 University Avenue S.E., Suite 400, Minneapolis, MN 55414, (612) 378-1875.

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GENERAL SURGEON AND/OR OB/GYN SURGEON to join 10 doctor multi-specialty group in Owatonna, a community of 18,500 located 68 miles south of the Twin Cities and 42 west of Rochester. Present staff consists of 7 family practitioners, 2 internists, and 1 general surgeon. Other specialties in the community and a close working relationship with the Mayo Clinic, the University of Minnesota hospitals, and other metropolitan centers provide for excellent consultations. Guaranteed salary first year with incentive program thereafter. Group Health, disability, life and accident insurance, retirement profit sharing, and automobiles provided by corporation. Contact: J. D. Miller, M.D. or James Wilkus, Administrator, Owatonna Clinic, P.A., 134 Southview, Owatonna, MN 55060. Telephone (507) 451-1120.

WANTED: FAMILY PHYSICIAN. Board certified or eligible, to help solo physician in South Minneapolis do full time family practice. First year salary leading to full partnership. Part time work available. Write: Minnesota Medicine-727 2221 University Avenue So. E. #400, Minneapolis, MN 55414.

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OPENINGS NOW AVAILABLE in Family Practice, OB-GYN, and Orthopedics. The Albert Lea Medical & Surgical Center, Ltd. is actively recruiting for the above positions to be filled hopefully by July-August 1983. We are an eighteen man multi specialty group with excellent benefits. Full participation after the first year. No accounts receivable buy in; incentive income plan; full and complete medical and life insurance coverage; excellent pension profit sharing program. We are recruiting family practitioners for near by satellite clinics. All moving costs assumed by the clinic. Contact G. C. Wilcox, M.D. at clinic (507) 373-1441 or at home (507) 373-6974, or the Clinic Administrator C. C. Lowery at clinic (above), or at home (507) 373-8083.

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COMMUNITY PSYCHIATRIST: Excellent opportunity for diversified practice with stable and innovative mental health organization. Current staff includes one full time and two part time experienced psychiatrists as well as more than 65 other direct care and support staff. Programs include inpatient, partial care, outpatient, special services for children, the elderly, and the chronically mentally ill as well as alcohol and drug dependency, and a very interesting comprehensive pre-paid program with a health maintenance organization. The Center has strong public and private support and serves an area of about 100,000 people. The area has extraordinary four-season recreational opportunities, yet is close to cultural and population centers. Current salary range is \$50,000-65,000 with appointment above minimum possible depending on qualifications. Included also is an attractive fringe package including interview expenses and a generous moving allowance. If interested, please contact Miller A. Friesen, Executive Director, Range Mental Health Center, Box 1188, Virginia, MN 55792 or call (collect) 218-749-2881. AA/EOE

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OFFICE SPACE FOR RENT: Physician in Medical Arts Building, 825 Nicollet Mall, Minneapolis, wishes to sublet his facilities to another physician on a part-time basis for the purpose of sharing overhead expenses. Call (612) 370-0553.

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FAMILY PRACTICE PHYSICIANS FOR RURAL MINNESOTA — Large multi-specialty group in West Central Minnesota is opening a satellite in a productive community of 3600 (Benson) which currently has two physicians and looking to replace a retiring physician and add another for growing practice. Pleasant Growing Area, High Quality of Life, Many Outdoor Recreational Opportunities (winter and summer), Progressive, Growing Medical Group, Liberal Financial Benefits, Outstanding Pension and Profit Sharing Program. Call: P. K. Olson, M.D., Willmar Medical Center, Willmar, MN 612-231-5000.

INTERNIST, GENERAL. Locum tenens. Bloomington-Lake Clinic. January 1, 1983 (or later) until July 1, 1983. Peter Menge, M.D., 3017 Bloomington Avenue, Mpls, 721-6511.

(Continued on Page 122)

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(Continued from page 121)

ALL OF THE ADVANTAGES . . . An opportunity to practice primary care with a progressive group of physicians that values quality medicine, patient and family — centered practice, continuity of care, service to the community, and group compatibility in a location where the advantages of the Twin Cities are easily available but in a small town with the freedoms of a slower paced atmosphere.

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NATIVE MINNESOTAN and graduate of the University of Minnesota Medical School finishing Internal Medicine residency in Texas seeks position as General Internist in Minnesota. Michael P. Martin, M.D., 210 East Upshaw, Temple, Texas 76501.

STAFF PSYCHIATRIST CMHC has an excellent opportunity for a staff psychiatrist. Must be board eligible. Programs include in-patient, out-patient, education and consultation, specialized services to children, the chronically mentally ill, and the chemically dependent delivered in conjunction with a seasoned team of multi-disciplinary mental health professionals including two part-time psychiatrists. Excellent four-season recreational area. Salary and fringe benefits negotiable. Contact: Donald E. Frees, ACSW, Area Program Director, P.O. Box 646, Bemidji, MN 56601. An Equal Opportunity Employer.

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(Continued on page 124.)

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(Continued from page 123)

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APPLICATIONS WELCOMED from board-certified general radiologists. U of M teaching appointment. Salary negotiable. Start July 1, 1983. Send application and curriculum vitae to Philippe L'Heureux, M.D., Saint Paul-Ramsey Medical Center, 640 Jackson Street, Saint Paul, Minnesota 55101.

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References: 1. Kales A et al: *J Clin Pharmacol* 17:207-213, Apr 1977 and data on file, Hoffmann-La Roche Inc., Nutley, NJ. 2. Kales A: Data on file, Hoffmann-La Roche Inc., Nutley, NJ. 3. Zimmerman AM: *Curr Ther Res* 13:18-22, Jan 1971. 4. Kales A et al: *JAMA* 241:1692-1695, Apr 20, 1979. 5. Kales A, Scharf MB, Kales JD: *Science* 201:1039-1041, Sep 15, 1978. 6. Kales A et al: *Clin Pharmacol Ther* 19:576-583, May 1976. 7. Kales A, Kales JD: *Pharmacol Physicians* 4:1-6, Sep 1970. 8. Frost JD Jr, DeLucchi MR: *J Am Geriatr Soc* 27:541-546, Dec 1979. 9. Dement WC et al: *Behav Med* 5:25-31, Oct 1978. 10. Vogel GW: Data on file, Hoffmann-La Roche Inc., Nutley, NJ. 11. Karacan I, Williams RL, Smith JR: The

sleep laboratory in the investigation of sleep and sleep disturbances. Scientific exhibit at the 124th annual meeting of the American Psychiatric Association, Washington, DC, May 3-7, 1971. 12. Pollak CP, McGregor PA, Weitzman ED: The effects of flurazepam on daytime sleep after acute sleep-wake cycle reversal. Presented at the 15th annual meeting of the Association for Psychophysiological Study of Sleep, Edinburgh, Scotland, June 30-July 4, 1975. 13. Data on file, Hoffmann-La Roche Inc., Nutley, NJ.

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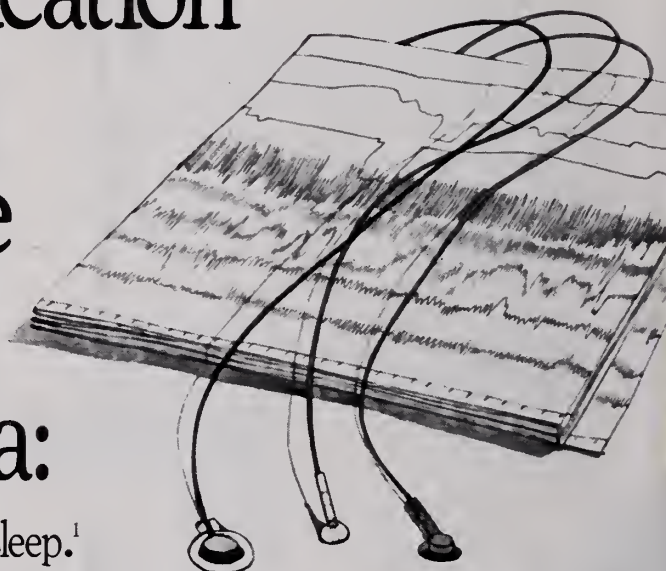
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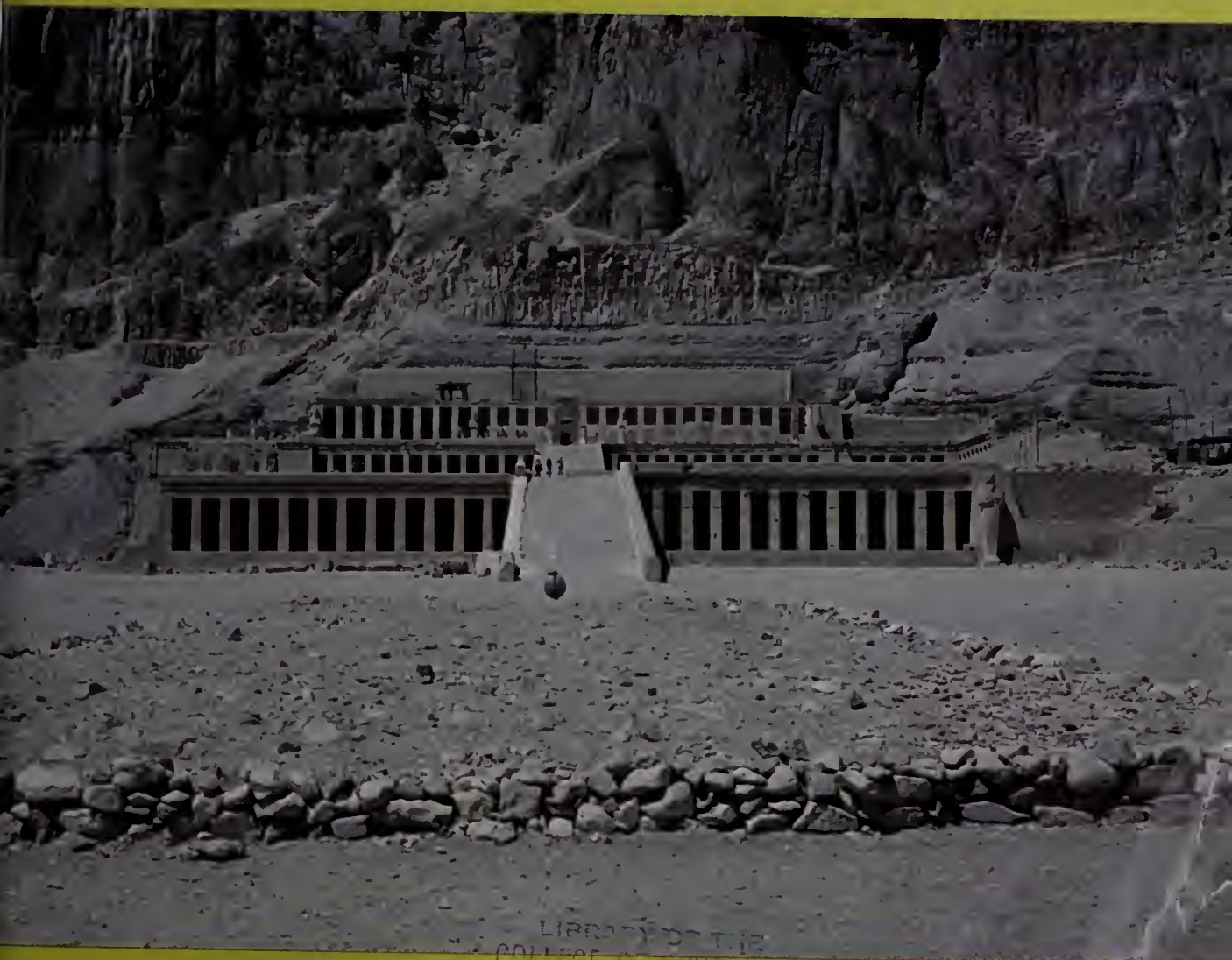
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President's Letter



Future of Hospital-Medical Staff Relationships

In the coming decade, we can expect to see more changes in the hospital-medical staff relationship than have occurred in the past fifty years. The reasons are many fold. There are decreasing government revenues for an ever increasing elderly welfare population; there is an ever increasing physician population that will compete amongst themselves and with the hospitals to provide services to patients; there will be health care coalitions composed of business and industry, often to the exclusion of health care providers, vying in the marketplace for the best health care buy. Private physicians and hospitals face increasing competition from alternative methods of delivery, HMOs, emergency centers, ambulatory surgical centers, birthing centers, home health care agencies, and many others. These facts will strain the traditional hospital-medical staff relationship so many of us work with daily.

In years past, health care seemed quite simple. Physicians saw patients in their offices, and if the situation demanded, admitted them to the hospital for intensive acute care. In the 1940s the government was even helpful with this arrangement, providing government funds to enhance hospital expansion through the Hill-Burton legislation. This certainly appeared to be a necessary step to rectify the bed shortages brought on by the depression, World War II, and an increasing population.

Matters went quite well until the 1960s when two events occurred. First, a number of court decisions made the hospital board of trustees ultimately responsible legally for events occurring in its hospital. No longer were the administrator and the chief-of-the-medical-staff solving problems by themselves. Corporate management of hospitals became the byword, reinforced by JCAH to the chagrin of the medical staff. Second, 1965 saw the enactment of Medicare and Medicaid into law. That year, America's cost of medical care was 5.9% of the gross national

product (GNP). It is presently 9.8% of the GNP. Of course, with the influx of government money came the regulatory bodies, such as PSROs and HSAs. Their presence did not always work to promote hospital-physician harmony. After a decade of regulatory failure, the new approach is procompetition.

Competitive forces will certainly effect the health care industry for years to come. The hospitals are taking the first attacks with decreased occupancy affecting revenues and the ability to finance capital purchases. Banks and other financial institutions are scrutinizing loans to these institutions very closely. Hospital departments are closing, and many hospitals are operating with deficits. Hospitals are facing proposed mergers, outside management consortiums, and even bankruptcy. They are alarmed as the government allows a \$4-5 billion Medicare-Medicaid shortfall to be shifted to private pay patients, or ultimately to the employer or third party payors. The traditional retrospective payment to hospitals is being replaced by prospective payments. So the hospitals' response is corporate restructuring, marketing, and diversification. Hospital-based and staffed clinics are operational as well as satellite clinics. Although these are acts of survival on the part of the hospital, many physicians see these actions as an infringement of their traditional arena.

Physicians are responding to the changes. This year the Tennessee Medical Association's House of Delegates voted to "accept the responsibility of actively opposing hospital corporations from involvement in and subsidization by a hospital corporation of the private practice of medicine." Free-standing ambulatory surgical centers have gone to court against third party payors to insure payments for services rendered in a non-hospital environment. Physicians are competing with established hospitals by building new for-profit hospitals, joining or creating HMOs,

PRESIDENTS LETTER

independent laboratories, and birthing centers. Expensive and refined technological services are being performed in physicians' offices, not to mention many surgical procedures previously performed in the hospitals. So it would appear that the battlelines are being drawn.

It was my good fortune to attend the Annual AMA State Health Legislative meeting held in January of this year. Addressing the subject of the future of hospital-physician relationships were: James H. Sammons, M.D. of the AMA and J. Alex McMahon of the AHA. Allow me to distill non-verbatim some of their comments. Whether physicians control hospitals or hospitals control physicians is a useless argument. We need each other, for one cannot exist without the other.

Unless we unite, government agencies will take over control of both in the name of cost efficiency. Working in unison, the new system will strive for management efficiency and efficacy of medical care.

At the onset, I spoke of changes in hospital-medical staff relationships. These changes can be unifying or disruptive. If the latter, the American people will suffer. Medical staffs and hospitals have the expertise in the health care field and must be strong voices in any discussion to assure continuing quality medical care.



Severin H. Koop, M.D.
President
Minnesota Medical Association

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Editor's Notebook

Bump in the Night

Reflections on Continuing Medical Education

"Medicine is my lawful wife and literature is my mistress. When I am bored with one I spend the night with the other."

Anton Chekhov

Last week something went bump in the middle of the night, and I awoke with a start to find myself chanting this superhuman pledge to compulsory medical education:

"I pledge to get completely organized this year. Instead of merely engaging in Continuing Medical Education, I will go for the Brass Ring; Continuous Medical Education. Education is a Social Good; it has Inherent Virtue; it fosters Self-Improvement, and it guarantees Self-Enlargement. As things now stand, the average doctor only spends 3.1 percent of his working day in activities related to continuing education, and 81.9 percent of his time is spent in patient contact or related activities.¹ I will reverse those percentages.

"How? I will tell you how. I will arise promptly at 4:30 A.M., brush my teeth, and review a current medical journal while shaving. At 4:35 A.M. give or take 30 seconds, I will start wading through unread journals, which will be neatly stacked on my Home Study Desk. As I read, I will dictate abstracts of concrete facts of relevant articles on my Home Dictating Machine. At roughly 4:59 A.M., I will alphabetize my growing Home Medical Library, to which each week I will add volumes.

"At 6:31 A.M., having completed my alphabetical chores and having sped read through a text or two, I will depart for the hospital. During the 16 minute drive, I will listen to audiotapes of the latest developments in my field.

"At 6:57 A.M., I will wheel into the hospital parking lot, land directly in front of my office, and leap across the lot in a single bound. My office will contain a warmed-up audiovisual tape and will be ready to play to show me how to do the latest procedure. After observing the tape, I will dash for the hospital auditorium, where I will attend my first CME course at 7:30 A.M. Unfortunately, I can attend only one 7:30 A.M. CME course a week. The other four days I have committee meetings.

"From 8:31 A.M. to 8:59 A.M., I will read the speaker's handout, checking it for veracity, errors, and references. The hospital library opens at 9:00 A.M. There I will do four things: 1) read the references suggested by the speaker; 2) initiate a MEDLAR or MEDLINE search for further information; 3) begin work on my latest article; and 4) prepare for teaching rounds.

"Although I'm not in academic medicine, I believe Education is Everything, and without it you would have nothing. Besides, teaching residents adds to my CME credits. If I pile up enough of those, maybe I'll be the Continuous Medical Education Person of the Year, which is equivalent to the Smartest Doctor on Earth.

"To achieve that lofty honor, I'll have to take more CME credit courses at the University, scan my specialty journal to find more credit specialty courses, forego my vacations to attend credit courses out of state, and take Over-Extension Credit Courses at night.

"If I get organized enough to pursue all of these Continuous Medical Education Goals, the only things I have to lose are my patients, my income, my partners, my wife, and my sanity – more or less in that order."

Conforming Mind At Work

This pledge reflects a conforming super-ego at work — overwhelmed by guilt for not keeping up. But thanks to a sense of reality, I won't be doing any of the things of which I dreamed. Like most busy physicians, I only have so much time and energy; I'm paid to make diagnoses rather than to study; and I'm persuaded most *compulsory* continuing education wastes my time.

Besides, I've always believed educating yourself is a personal responsibility and choice — a private matter emanating from a sense of curiosity. For educated physicians who have gone through four years of liberal arts education, four years of medical school, an average of four years of supervised hospital training, and a year or so of studying for specialty boards, the words *compulsory*, and *mandatory* are irrelevant, offensive, unnecessary and *mandatory* and even childish.

Finally, I'm skeptical about the business aspects of continuing medical education (CME). CME, you see, is a big business.

- American physicians, medical schools, hospitals, medical societies, industries, and government spend \$500 million annually on continuing medical education.²
- Physicians forfeit \$1.4 billion a year by taking time away from their practices to attend continuing medical education courses.³
- Thirty five states (including Minnesota) require continuing medical education to renew licensure, and 22 specialty societies are considering recertification procedures that will require continuing education.⁴
- From 1972 to 1977 the number of continuing education courses listed in JAMA grew from 2082 to 7033 — a 22 percent annual increase.⁵ If that trend has continued, you'll have more than 20,000 courses to pick from in 1983.

This Issue

This issue of MINNESOTA MEDICINE contains an excellent article on continuing medical education by Seymour Handler, pathologist at North Memorial Hospital in Minneapolis. Doctor Handler describes a pathologist-run 20 year old CME program to help clinicians improve their transfusion practices, discusses the essential ingredients of good CME courses, and documents the educational pay-off in terms of decreased transfusions at North Memorial compared to sister institutions.⁶

But, Alas

But, alas, outside of Handler's article, which deals with selective rather than compulsory education, little scientific evidence exists that mandatory continuing medical education courses do any clinical good, i.e. help physicians perform any better in treating patients. Certainly there is no concrete evidence that says the benefits are worth the cost.

What I'm saying will strike some as outrageous. Education not worth the cost? Nonsense. Intuitively, *everybody knows* education is worth *any* cost. I don't buy that argument. Perhaps the *right* kind of education, or education on something that *interests* the physician, is worthwhile, or perhaps education that relates *directly* to your practice, but *not mindless mandatory education* — not education that merely piles up CME credits.

I'm on the side of Leonard D. Fenninger, M.D. group Vice President for Medical Education at the American Medical Association, who made these comments three years ago: "No evidence has been presented that confining medical education will make a physician behave responsibly towards patients or their problems . . . I believe only a small portion of the public has been convinced that mandatory continuing medical education is a suitable means of assuring safe, timely and effective medical care. I also believe that a small minority of physicians are convinced of the usefulness of mandatory continuing medical education."⁷

I also agree with Doctor Phil Manning, writing in this week's JAMA: "Traditional continuing medical education (CME) . . . has limitations: it is memory based, involves a group endeavor with diffuse goals, often unrelated to practice, is an inappropriate remedy for many problems in patient care, is hampered by poor-quality evaluation, and is governed

EDITOR'S NOTEBOOK

more by market factors than educational outcomes."⁸

3Rs

It is not enough, of course, to be critical: you should offer an alternative. My view of continuing medical education rests on the 3Rs — Reading, Retrieving, and 'Riting. Each of these activities requires the work of an active mind, rather than the passive tasks of listening to audiotapes, watching videotapes, or attending lectures.

Reading

For the reading part, I would simply follow the advice of William Scheckler, M.D., from the Department of Family Advice and Practice at the University of Wisconsin at Madison.⁹ His advice, which I quote, is:

"1. The cornerstone of all CME should be carefully selected journals that are regularly read and appropriately filed for future reference.

2. Every resident should have *at least* two weekly peer review journals, two monthly refereed medical journals, and two standard newsletters as a basis for his reading library.

3. Since reading time is limited, it is essential to be realistic in selecting journals that cover major areas of interest of the residents.

4. Throwaway journals, nonrefereed medical journals, and journals that are developed primarily for profit should be eliminated from medical practice. This is a direct result of item 3, and of my conviction that the journals are more substantive when they are in the standard refereed category.

5. One effective approach to reading medical journals is as follows:

(a) Always read the editorials first, as they are frequently miniature review articles.

(b) Read the abstracts of all articles that have a title that appears relevant to the practice and interests of the physician.

(c) Based on the abstracts, read at least two articles per journal in depth per issue.

(d) Select the special articles or sections of the journal that have the most interest and relevance to your practice and read those on a regular basis."

Retrieving

For *Retrieving*, develop a system of ripping, filing, or binding journals. Whatever you do, keep at it once a week or once a month. You may want to use a personal computer, but its cost and programing may discourage you. Whatever system you use, make it personal. Beware of the never-never land of good intentions — complete storage, exhaustive cross-indexing, and infallible retrieval of everything you've ever read.

A lot of personal systems have been written about, and I recommend these articles for your study:

System

1. Fuller, E.: A system for filing medical literature, *Ann Int med* 68:684-693, 1968.
2. DeAfarcon, R.: A Personal Medical Reference File, *Lancet*, 1:301-305, 1969.
3. Singer, K.: Where Did I See That Article? *JAMA*, 241:1492-1493, 1979.
4. Gaeke, R. and Gaeke, M.: Filing Medical Literature, *Ann Int Med*, 78:985-987, 1973.
5. Sander, L: How to File Medical Articles — And Find Them Again; *Medical Economics* April 27, 1981.

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EDITOR'S NOTEBOOK

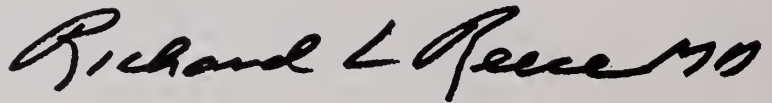
'Riting

Finally, there's 'Riting. This can take various forms. You can write handouts for your presentations to medical staff meetings. You can write articles for MINNESOTA MEDICINE. We would be delighted to consider them for publication. If you don't have time for articles, write Letters to the Editor.

You might ask: why write? I would answer: because it helps you to think, to commit your thoughts to paper, and to test the quality of your thinking before critics. You don't learn to write, or to think, by answering: *A, B, C, or none of the above*. You learn by doing, by engaging an active mind to accomplish a specific purpose. Writing, in short, is a straight forward way of educating yourself.

Closing Remarks

The 3Rs are a practical alternative to compulsory continuing medical education. By following them, you should be able to acquire enough CME credits to meet Minnesota standards. I'm sure you have struck upon your own approaches to meeting CME requirements. That's fine. CME ought to be a matter of individual preference and responsibility. As I've always said: different bumps for different folks.



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Cover Photograph

"Funerary Temple of Queen Hatshepsut"

Dr. John K. Meinert, Mayo Clinic internist and member of the Board of Editors, took the cover picture while on a trip to rural Africa in 1981 with the People to People Medical Delegation.

Queen Hatshepsut was an Egyptian queen who ruled in 1503-1482 B.C. and attained unprecedented power for a queen. She attained the full title and regalia of a pharaoh and ruled the country effectively for approximately 21 years. She married her half brother, Thutmose, the Second. Her father was Thutmose, the First, and her mother was Queen Ahmose. The funerary temple is located at Deir el-Bahri, Egypt.

Dr. Meinert is an AMA Delegate and is a former president of the Minnesota Medical Association. He took the cover photograph with a Rollet B-35, which he claims is not very sophisticated but a camera with which he has a great deal of good luck.

C₇ Burst Fracture with Initial "Complete" Tetraplegia

JOHN R. MAWK, M.D.*

Bursting type fractures of the cervical vertebra are produced by combined compression and flexion force vectors. The myelopathy accompanying this fracture is generally felt to be due to spinal cord contusion. In a one year period, six patients with burst fracture of the seventh cervical vertebral body were seen at our institution. These patients demonstrated a radiographic spectrum of osseous disruption which did not correlate with the occurrence of myelopathy. Of the three patients who did present with "complete" motor and sensory spinal cord deficits, two are ambulatory and the third has protective sensation. We discovered a uniform pathophysiology in these cases. Based on clinical and radiographic observations, we propose that there exists a specific type of bursting fracture which produces myelopathy through an ischemic rather than a contusive means. There is reason for cautious optimism even in some patients with "complete" spinal cord injury.

PATIENTS WITH spinal cord injury are classified as having "complete" lesions if there is no evidence of neurologic activity below the level of the lesion and as "incomplete" if there is some function distal to the site of injury. As a general rule, patients with incomplete lesions are felt to have some chance of recovery whereas patients with complete lesions are usually regarded as having no such chance. We encountered three patients with C₇ vertebral body burst fractures in whom tetraplegia and sensory loss were judged to be complete below the C₇ root level. The only evidence of neurologic function was sparing of the bulbocavernosus reflex in two of them. Of the three patients, one is now normal neurologically, one walks with bilateral leg braces and the third has protective sensation. We hypothesize that mechanical forces fracture the C₇ body in a typical manner and that the myelopathy which sometimes accompanies the fracture is ischemic and therefore reversible in nature.

Case Reports

Case 1

A 23-year-old intoxicated male dove into shallow water, striking the posterior vertex of his head. There was immediate tetraplegia. The admission blood pressure was 85/58. Neurologic examination showed complete motor and sensory loss below the C₇ level. The deep tendon reflexes were absent and although the anal sphincter was flaccid, the bulbocavernosus reflex was brisk. Cervical spine films demonstrated a bursting type C₇ body fracture, with minimal

posterior dislocation of osseous elements into the spinal canal (Figure 1(A)). A cervical myelogram performed via the lateral (C₂) approach showed only minimal ventral extradural defect.

Within the first 24 hours, after stabilization of blood pressure and placement of cervical tongs for traction, there was return of ankle and knee reflex activity. Some crude posterior column sensation returned



Fig. 1 (A) — Lateral Xray showing C₇ burst fracture with minimal posterior displacement of bone fragments.

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within the second hospital day. It was elected to treat the patient conservatively with a halo vest. Motor and sensory function continued to improve. The patient was removed from his halo device after eight weeks. He was discharged on the 118th hospital day neurologically normal.

Case 2

A 19-year old male was involved in an automobile accident in which he was thrown from the vehicle and rendered unconscious for approximately five minutes. On awakening he noted inability to move his legs and weak hands. He was transferred from a community hospital to our institution.

On admission, the patient's blood pressure was 88/58. Abdominal examination showed absent bowel sounds and a flaccid abdominal wall. Neurologic examination showed weak hand intrinsic musculature bilaterally and complete paralysis and areflexia in the legs. Sensory loss was patchy in the C8 dermatome and complete below that level. There was no volitional or reflex sphincter function, nor did he have priapism.

Cervical spine films demonstrated a fracture of the C7 body with protrusion of bone fragments posteriorly into the spinal canal (Figure 1 (B)). A peritoneal lavage was grossly positive. The patient was placed in long traction prior to awake nasal intubation for laparotomy. A splenic capsular tear was repaired. Immediately upon awakening from surgery the patient evidenced intense pain from the abdominal incision and splinting of the abdominal wall. Sensory examination now showed a distinct sensory level at the T10 dermatome; clonus in both ankles appeared. It had not been possible during laparotomy to achieve satisfactory osseous reduction with 40 pounds of cervical traction. Because of his neurologic improvement, it was felt that operative decompression was warranted; the patient was taken back to the operative suite, where anterior decompression of C7 and iliac bone fusion of C6-T1 was carried out.

Postoperatively there was prompt return of sensation in the upper lumbar dermatomes. The patient was placed in a halo vest on the

third postoperative day. He rapidly achieved spontaneous voiding ability. There was some return of voluntary movement in scattered muscle groups in both legs by the fortieth hospital day. He was discharged on the 84th hospital day, at which time he required the use of heavy leg braces bilaterally.

The patient has had further neurologic improvement since discharge. Currently he uses a walker for flat ambulation and is able to negotiate stairs unassisted. He reports that erection and ejaculation are normal and he is able to void with minimal residual in the supine position.

Case 3

A 23-year-old carpenter fell twelve feet off a building and was rendered unconscious for approximately twenty minutes. Upon awakening he noted tingling in both fifth fingers, absent sensation in the legs and trunk and inability to move his legs. He was referred to our institution.

Physical examination revealed a scalp abrasion in the region of the posterior vertex. The blood pressure was 94/64. The patient had complete sensory loss below the seventh cervical dermatome as well as complete paralysis and areflexia of both legs. Although the anal sphincter was flaccid, there was a weak bulbocavernosus reflex.

Cervical spine films demonstrated the familiar appearance of a bursting type fracture of the body of C7. It was our impression that there was only minimal narrowing of the AP diameter of the spinal canal. The patient was placed in tong traction and cervical myelography was performed via the lateral C1-C2 approach. This study demonstrated to better advantage the degree of osseous compromise of the spinal canal (Figure 1 (C)). The traction weight was rapidly increased to 65 pounds, but serial Xrays revealed that the fracture was irreducible. It was elected to carry out acute anterior decompression upon this patient.

As the patient was being readied for surgery we instituted controlled hypertension by administration of 1000 ccs of plasma protein fraction and low doses of dopamine. Within minutes of

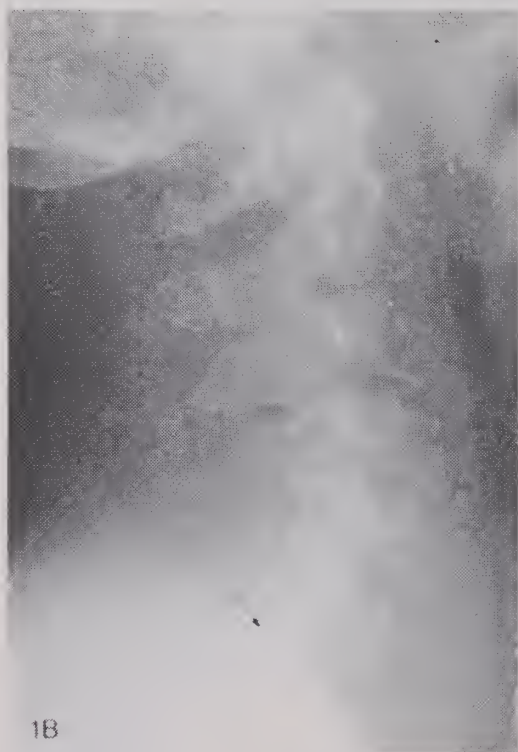


Fig. 1 (B) — Lateral cervical spine film of Patient Two demonstrating bone fragments protruding posteriorly into the spinal canal (arrow).

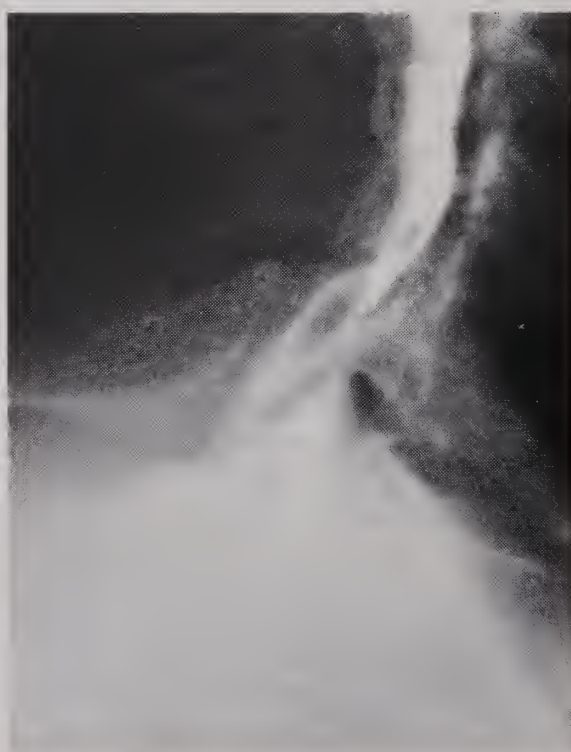


Fig. 1 (C) — C2 myelogram demonstrating considerable ventral extradural defect in Patient Three.

elevating the blood pressure to the 140/100 range, the patient developed tingling in his left foot. On repeat neurologic examination he was now noted to have good proprioceptive sensation in the left foot and at least crude proprioception in the right foot. Sharp-dull discrimination developed in the left foot, as well.

Anterior decompression of the C7 burst fracture and autogenous iliac bone fusion were carried out. Postoperatively the patient's sensory findings changed little. Controlled hypertension was maintained for two days. The adductor reflexes returned on the fifth postoperative day. We were hopeful that this patient would have the same impressive recovery as our prior patients.

Abruptly on the twelfth postoperative day the patient developed a stuttering, ascending myelopathy which progressed over the next week to involve both C5, C6 and C7 dermatomes. Repeat myelography was carried out twice via C2 approach and failed to reveal any intrinsic or extrinsic cord lesion. A CT scan of the spinal cord failed to show any evidence of hematomyelia. Early, severe atrophy of the legs was noted at this time. An electromyogram of the leg muscles was consistent with either a pure motor neuropathy or anterior horn cell disease. Neurologic consultants felt that although a post-traumatic Guillain-Barré syndrome was possible, anterior spinal cord infarction was more likely.

After several weeks, the patient began to recover function in the C5 through C8 dermatomes bilaterally. At the time of discharge, on the 85th hospital day, he had nearly complete recovery of all arm and hand muscles. He did ultimately achieve proprioceptive sensation in both feet and legs; there is little spasticity. We believe that his late-onset, ascending deficit was most likely due to spinal cord ischemia.

Discussion

Bursting fractures of the cervical vertebrae are typically produced by blows to the head centered near the vertex which produce a combined compression-flexion force vector.⁵ The uniform radiographic appearance of these fractures is striking. In the lateral projection the posterior cortex of the C7 body is seen to be converted from its usual posteriorly concave shape to one which is decidedly convex. The lateral view also may demonstrate superior migration of the retropulsed portions of the body. In the AP projection a vertical fracture line is often seen.

Computerized tomographic scanning of this fracture more clearly demonstrates the very uniform manner in which the vertebral body is disrupted. (Figure 2 (A)) In our cases a pattern resembling somewhat the wings of a butterfly has been observed. As the two symmetric fragments migrate posteriorly into the canal they are drawn superiorly by the fibers of the posterior longitudinal ligament at the moment when the neck is in flexion. Following the impact, as the neck is restored to neutral position, the bone fragments appear to become trapped superiorly; for this reason they are refractory to conservative reduction. Three cases have been operated upon — patients two and three described in detail above and a third patient who was neurologically intact but had severe neck pain and marked reduction of the cross-sectional area of the spinal canal. The radiographic findings correlated perfectly with the operative findings in all three cases.

In addition, in all three cases, a vertical rent in the posterior longitudinal ligament was found at the time of surgery. The transverse distance between the two "butterfly" fragments in each case was about two millimeters. Thus in addition to posterior and superior displacement of these fragments we have also noted that they are laterally displaced (Figure 2 (B)).

Although changes in regional spinal cord blood flow following spinal cord injury have been well documented in the experimental animal^{1-4,6}, the occurrence of these blood flow changes in man is not known. The good neurological outcome in our first and second patients strongly argues that these patients may

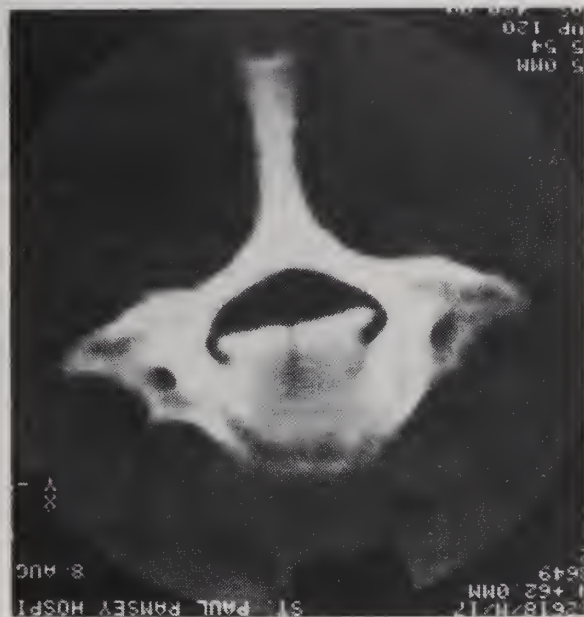


Fig. 2 (A) — CT scan of neurologically intact patient with marked reduction in AP diameter of the spinal canal due to C7 burst fracture.

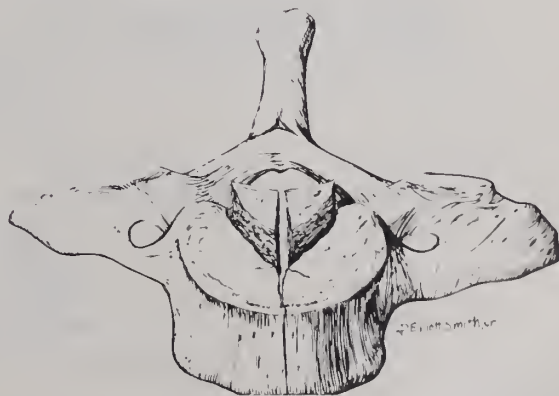


Fig. 2 (B) — Three dimensional artist's conception of C7 burst fracture, showing posterior superior and slight lateral migration of fracture fragments.

have incurred an ischemic rather than a contusive injury to the spinal cord. The initial improvement in our third patient who underwent controlled hypertensive therapy may lend weight to this argument. Furthermore, the rapidity of improvement may correlate better with an ischemic etiology. In attempting to relate the fracture mechanics to the observed cord injuries, one could speculate that at the moment of impact, as the cervical vertebral body explodes and the two principal fragments migrate postero-superolaterally there is injury to the ventral aspect of the spinal cord or to the anterior spinal artery. It is reasonable that spasm of the anterior medullary artery in this region could produce a seemingly "complete" neurologic deficit in certain individuals, particularly if the posterior spinal arterial distribution is limited in size. Individual variations in the spinal cord blood supply may be at least as important in the production of myelopathy as the degree of mechanical disruption; certainly hypotension might exacerbate an existing degree of cord ischemia.

Conclusion

A small series of burst fractures of the seventh

TABLE I

C7 Burst Fracture Patients — Summary

Patient	Treatment	Outcome
Admission	Halo vest	Intact
1 Tetraplegic*	Surgical	Ambulatory
2 Tetraplegic*	decompression	
3 Tetraplegic*	Surgical	Protective
	decompression	sensation
4 Intact*	Halo vest	Intact
5 Intact	Surgical	Intact
	decompression	
6 Intact	Halo vest	Intact

*Signifies hypotensive on admission

cervical vertebra has been presented. There is excellent clinical and radiographic correlation with respect to the pathophysiology of the process. The over-all behavior of those patients with deficit seems to correspond better with an ischemic rather than a contusive etiology for myelopathy. Accordingly, in patients with this particular type of fracture, neurosurgical care should be devoted to augmentation of the mean arterial pressure and acute decompression of irreducible fracture fragments in order to ensure the best possible neurologic outcome.

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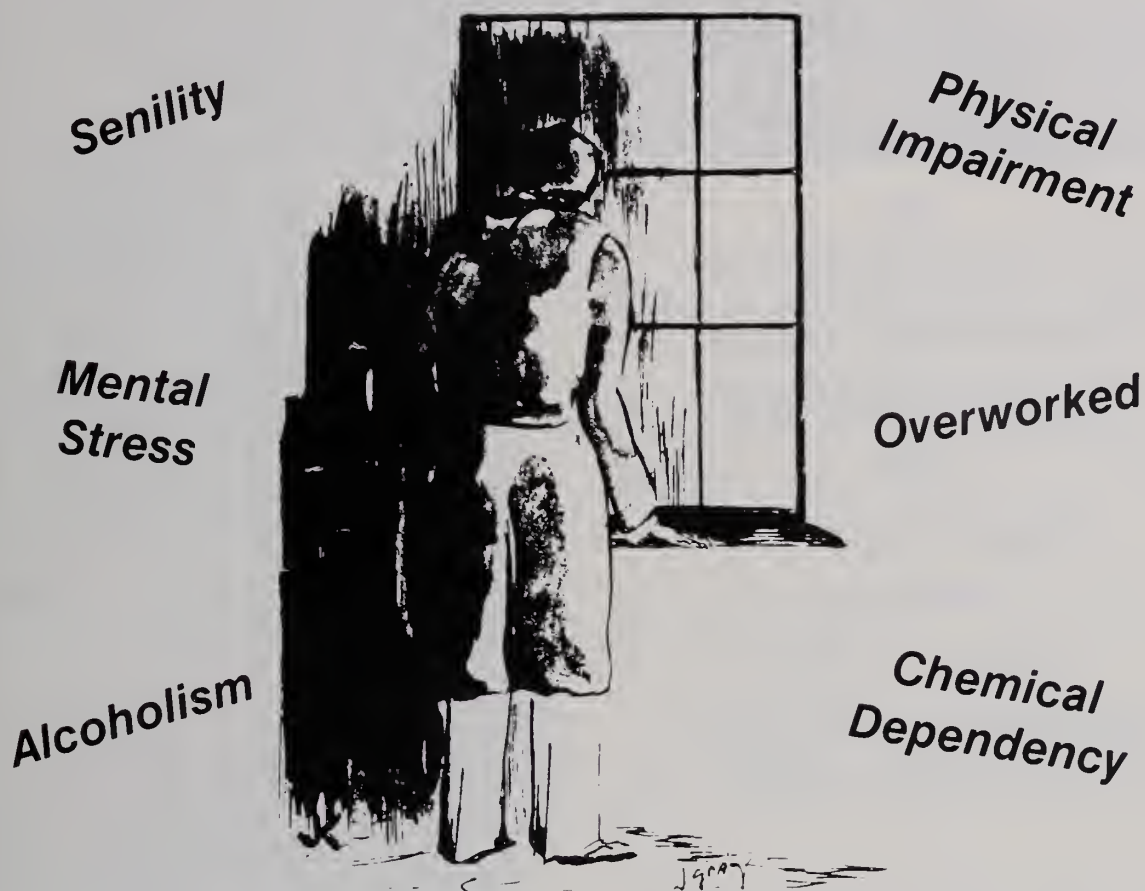
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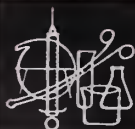
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**BRIEF SUMMARY
PRDCARDIA* CAPSULES**
(nifedipine)

For Oral Use

INDICATIONS AND USAGE: I. **Vasospastic Angina:** PRDCARDIA (nifedipine) is indicated for the management of vasospastic angina confirmed by any of the following criteria: 1) classical pattern of angina at rest accompanied by ST segment elevation, 2) angina or coronary artery spasm provoked by ergonovine, or 3) angiographically demonstrated coronary artery spasm. In those patients who have had angiography, the presence of a significant fixed obstructive disease is not incompatible with the diagnosis of vasospastic angina, provided that the above criteria are satisfied. PRDCARDIA may also be used where the clinical presentation suggests a possible vasospastic component but where vasospasm has not been confirmed, e.g., where pain has a variable threshold on exertion or in unstable angina where electrocardiographic findings are compatible with intermittent vasospasm, or when angina is refractory to nitrates and/or adequate doses of beta blockers.

II. **Chronic Stable Angina (Classical Effort-Associated Angina):** PRDCARDIA is indicated for the management of chronic stable angina (effort-associated angina) without evidence of vasospasm in patients who remain symptomatic despite adequate doses of beta blockers and/or organic nitrates or who cannot tolerate those agents.

In chronic stable angina (effort-associated angina) PRDCARDIA has been effective in controlled trials of up to eight weeks duration in reducing angina frequency and increasing exercise tolerance, but confirmation of sustained effectiveness and evaluation of long-term safety in those patients are incomplete.

Controlled studies in small numbers of patients suggest concomitant use of PRDCARDIA and beta blocking agents may be beneficial in patients with chronic stable angina, but available information is not sufficient to predict with confidence the effects of concurrent treatment, especially in patients with compromised left ventricular function or cardiac conduction abnormalities. When introducing such concomitant therapy, care must be taken to monitor blood pressure closely since severe hypotension can occur from the combined effects of the drugs. (See Warnings.)

CONTRAINDICATIONS: Known hypersensitivity reaction to PRDCARDIA.

WARNINGS: Excessive Hypotension: Although in most patients, the hypotensive effect of PRDCARDIA is modest and well tolerated, occasional patients have had excessive and poorly tolerated hypotension. These responses have usually occurred during initial titration or at the time of subsequent upward dosage adjustment, and may be more likely in patients on concomitant beta blockers.

Severe hypotension and/or increased fluid volume requirements have been reported in patients receiving PRDCARDIA together with a beta blocking agent who underwent coronary artery bypass surgery using high dose fentanyl anesthesia. The interaction with high dose fentanyl appears to be due to the combination of PRDCARDIA and a beta blocker, but the possibility that it may occur with PRDCARDIA alone, with low doses of fentanyl, in other surgical procedures, or with other narcotic analgesics cannot be ruled out.

Increased Angina: Occasional patients have developed well documented increased frequency, duration or severity of angina on starting PRDCARDIA or at the time of dosage increases. The mechanism of this response is not established but could result from decreased coronary perfusion associated with decreased diastolic pressure with increased heart rate, or from increased demand resulting from increased heart rate alone.

Beta Blocker Withdrawal: Patients recently withdrawn from beta blockers may develop a withdrawal syndrome with increased angina, probably related to increased sensitivity to catecholamines. Initiation of PRDCARDIA treatment will not prevent this occurrence and might be expected to exacerbate it by provoking reflex catecholamine release. There have been occasional reports of increased angina in a setting of beta blocker withdrawal and PRDCARDIA initiation. It is important to taper beta blockers if possible, rather than stopping them abruptly before beginning PRDCARDIA.

Congestive Heart Failure: Rarely, patients, usually receiving a beta blocker, have developed heart failure after beginning PRDCARDIA. Patients with tight aortic stenosis may be at greater risk for such an event.

PRECAUTIONS: General: Hypotension: Because PRDCARDIA decreases peripheral vascular resistance, careful monitoring of blood pressure during the initial administration and titration of PRDCARDIA is suggested. Close observation is especially recommended for patients already taking medications that are known to lower blood pressure. (See Warnings.)

Peripheral edema: Mild to moderate peripheral edema, typically associated with arterial vasodilation and not due to left ventricular dysfunction, occurs in about one in ten patients treated with PRDCARDIA. This edema occurs primarily in the lower extremities and usually responds to diuretic therapy. With patients whose angina is complicated by congestive heart failure, care should be taken to differentiate this peripheral edema from the effects of increasing left ventricular dysfunction.

Drug interactions: Beta-adrenergic blocking agents: (See Indications and Warnings.) Experience in over 1400 patients in a non-comparative clinical trial has shown that concomitant administration of PRDCARDIA and beta-blocking agents is usually well tolerated, but there have been occasional literature reports suggesting that the combination may increase the likelihood of congestive heart failure, severe hypotension or exacerbation of angina.

Long-acting nitrates: PRDCARDIA may be safely co-administered with nitrates, but there have been no controlled studies to evaluate the antianginal effectiveness of this combination.

Digitalis: Administration of PRDCARDIA with digoxin increased digoxin levels in nine of twelve normal volunteers. The average increase was 45%. Another investigator found no increase in digoxin levels in thirteen patients with coronary artery disease. In an uncontrolled study of over two hundred patients with congestive heart failure during which digoxin blood levels were not measured, digitalis toxicity was not observed. Since there have been isolated reports of patients with elevated digoxin levels, it is recommended that digoxin levels be monitored when initiating, adjusting, and discontinuing PRDCARDIA to avoid possible over- or under-digitalization.

Carcinogenesis, mutagenesis, impairment of fertility: When given to rats prior to mating, nifedipine caused reduced fertility at a dose approximately 30 times the maximum recommended human dose.

Pregnancy: Category C. Please see full prescribing information with reference to teratogenicity in rats, embryotoxicity in rats, mice and rabbits, and abnormalities in monkeys.

ADVERSE REACTIONS: The most common adverse events include dizziness or light-headedness, peripheral edema, nausea, weakness, headache and flushing each occurring in about 10% of patients, transient hypotension in about 5%, palpitation in about 2% and syncope in about 0.5%. Syncopal episodes did not recur with reduction in the dose of PRDCARDIA or concomitant antianginal medication. Additionally, the following have been reported: muscle cramps, nervousness, dyspnea, nasal and chest congestion, diarrhea, constipation, inflammation, joint stiffness, shakiness, sleep disturbances, blurred vision, difficulties in balance, dermatitis, pruritus, urticaria, fever, sweating, chills, and sexual difficulties. Very rarely, introduction of PRDCARDIA therapy was associated with an increase in anginal pain, possibly due to associated hypotension.

In addition, more serious adverse events were observed, not readily distinguishable from the natural history of the disease in these patients. It remains possible, however, that some or many of these events were drug related. Myocardial infarction occurred in about 4% of patients and congestive heart failure or pulmonary edema in about 2%. Ventricular arrhythmias or conduction disturbances each occurred in fewer than 0.5% of patients.

Laboratory Tests: Rare, mild to moderate, transient elevations of enzymes such as alkaline phosphatase, CPK, LDH, SGOT, and SGPT have been noted, and a single incident of significantly elevated transaminases and alkaline phosphatase was seen in a patient with a history of gall bladder disease after about eleven months of nifedipine therapy. The relationship to PRDCARDIA therapy is uncertain. These laboratory abnormalities have rarely been associated with clinical symptoms. Cholestasis, possibly due to PRDCARDIA therapy, has been reported twice in the extensive world literature.

HOW SUPPLIED: Each orange, soft gelatin PRDCARDIA CAPSULE contains 10 mg of nifedipine. PRDCARDIA CAPSULES are supplied in bottles of 100 (NDC 0069-2600-66), 300 (NDC 0069-2600-72), and unit dose (10x10) (NDC 0069-2600-41). The capsules should be protected from light and moisture and stored at controlled room temperature 59° to 77°F (15° to 25°C) in the manufacturer's original container.

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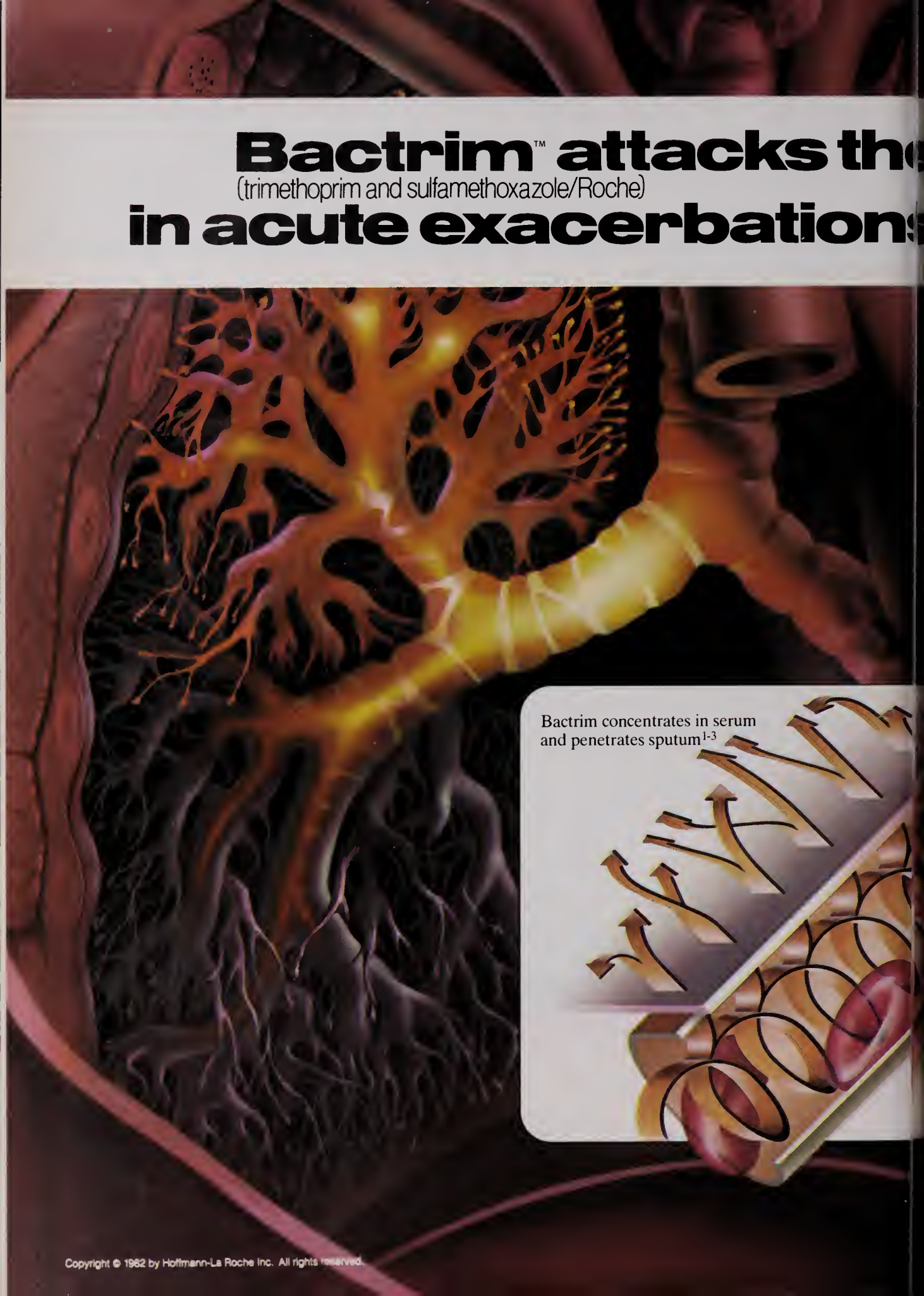
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In sputum cultures from patients with acute exacerbations of chronic bronchitis, *H. influenzae* and *S. pneumoniae* are isolated more often than any other pathogens.^{4,5} One study of transtracheal aspirates from 76 patients with acute exacerbations found that 80% of the isolates were of these two pathogens.⁵

Bactrim is effective *in vitro* against most strains of both *S. pneumoniae* and *H. influenzae*—even ampicillin-resistant strains. And in acute exacerbations of chronic bronchitis involving these two pathogens, sputum cultures taken seven days after a two-week course of therapy showed that Bactrim eradicated these bacteria in 91% (50 of 55) of the patients treated.⁶

Bactrim reduces coughing
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involving nearly 700 patients.¹⁰ Overall clinical condition of the patients, changes in sputum purulence, reduction in sputum volume and microbiological clearance of pathogens—all improved more with Bactrim therapy than with tetracyclines. G.I. side effects occurred in only 7% of patients treated with Bactrim compared with 12% of tetracycline-treated patients. (See Adverse Reactions in summary of product information on next page.)

Bactrim is contraindicated in pregnancy at term and nursing mothers, infants under two months of age, documented megaloblastic anemia due to folate deficiency and hypersensitivity.

Bactrim DS. For acute exacerbations of chronic bronchitis in adults* when it offers an advantage over single-agent antibacterials.

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(trimethoprim and sulfamethoxazole/Roche)

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Indications and Use: For the treatment of urinary tract infections due to susceptible strains of the following organisms: *Escherichia coli*, *Klebsiella-Enterobacter*, *Proteus mirabilis*, *Proteus vulgaris*, *Proteus morganii*. It is recommended that initial episodes of uncomplicated urinary tract infections be treated with a single effective antibacterial agent rather than the combination. *Note:* The increasing frequency of resistant organisms limits the usefulness of all antibacterials, especially in these urinary tract infections.

For acute otitis media in children due to susceptible strains of *Haemophilus influenzae* or *Streptococcus pneumoniae* when in physician's judgment it offers an advantage over other antimicrobials. To date, there are limited data on the safety of repeated use of Bactrim in children under two years of age. Bactrim is not indicated for prophylactic or prolonged administration in otitis media at any age.

For acute exacerbation of chronic bronchitis in adults due to susceptible strains of *Haemophilus influenzae* or *Streptococcus pneumoniae* when in physician's judgment it offers an advantage over a single antimicrobial agent.

For enteritis due to susceptible strains of *Shigella flexneri* and *Shigella sonnei* when antibacterial therapy is indicated.

Also for the treatment of documented *Pneumocystis carinii* pneumonia.

Contraindications: Hypersensitivity to trimethoprim or sulfonamides; patients with documented megaloblastic anemia due to folate deficiency; pregnancy at term; nursing mothers because sulfonamides are excreted in human milk and may cause kernicterus; infants less than 2 months of age.

Warnings: BACTRIM SHOULD NOT BE USED TO TREAT STREPTOCOCCAL

PHARYNGITIS. Clinical studies show that patients with group A β -hemolytic streptococcal tonsillopharyngitis have higher incidence of bacteriologic failure when treated with Bactrim than do those treated with penicillin. Deaths from hypersensitivity reactions, agranulocytosis, aplastic anemia and other blood dyscrasias have been associated with sulfonamides. Experience with trimethoprim is much more limited but occasional interference with hemopoiesis has been reported as well as an increased incidence of thrombopenia with purpura in elderly patients on certain diuretics, primarily thiazides. Sore throat, fever, pallor, purpura or jaundice may be early signs of serious blood disorders. Frequent CBC's are recommended; therapy should be discontinued if a significantly reduced count of any formed blood element is noted.

Precautions: General: Use cautiously in patients with impaired renal or hepatic function, possible folate deficiency, severe allergy or bronchial asthma. In patients with glucose-6-phosphate dehydrogenase deficiency, hemolysis, frequently dose-related, may occur. During therapy, maintain adequate fluid intake and perform frequent urinalyses, with careful microscopic examination, and renal function tests, particularly where there is impaired renal function. Bactrim may prolong prothrombin time in those receiving warfarin; reassess coagulation time when administering Bactrim to these patients.

Pregnancy: Teratogenic Effects. Pregnancy Category C. Because trimethoprim and sulfamethoxazole may interfere with folic acid metabolism, use during pregnancy only if potential benefits justify the potential risk to the fetus.

Adverse Reactions: All major reactions to sulfonamides and trimethoprim are included, even if not reported with Bactrim. *Blood dyscrasias:* Agranulocytosis, aplastic anemia, megaloblastic anemia, thrombopenia, leukopenia, hemolytic anemia, purpura, hypoprothrombinemia and methemoglobinemia. *Allergic reactions:* Erythema multiforme, Stevens-Johnson syndrome, generalized skin eruptions, epidermal necrolysis, urticaria, serum sickness, pruritus, exfoliative dermatitis, anaphylactoid reactions, periorbital edema, conjunctival and scleral injection, photosensitization, arthralgia and allergic myocarditis. *Gastrointestinal reactions:* Glossitis, stomatitis, nausea, emesis, abdominal pains, hepatitis, diarrhea, pseudomembranous colitis and pancreatitis. *CNS reactions:* Headache, peripheral neuritis, mental depression, convulsions, ataxia, hallucinations, tinnitus, vertigo, insomnia, apathy, fatigue, muscle weakness and nervousness. *Miscellaneous reactions:* Drug fever, chills, toxic nephrosis with oliguria and anuria, periarteritis nodosa and L.E. phenomenon. Due to certain chemical similarities to some goitrogens, diuretics (acetazolamide, thiazides) and oral hypoglycemic agents, sulfonamides have caused rare instances of goiter production, diuresis and hypoglycemia in patients; cross-sensitivity with these agents may exist. In rats, long-term therapy with sulfonamides has produced thyroid malignancies.

Doseage: Not recommended for infants less than two months of age.

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Children: Recommended dosage for children with urinary tract infections or acute otitis media—8 mg/kg trimethoprim and 40 mg/kg sulfamethoxazole per 24 hours, in two divided doses for 10 days. Use identical daily dosage for 5 days for shigellosis.

For patients with renal impairment: Use recommended dosage regimen when creatinine clearance is above 30 ml/min. If creatinine clearance is between 15 and 30 ml/min, use one-half the usual regimen. Bactrim is not recommended if creatinine clearance is below 15 ml/min.

ACUTE EXACERBATIONS OF CHRONIC BRONCHITIS IN ADULTS

Usual adult dosage: 1 DS tablet (double strength), 2 tablets (single strength) or 4 teasp (20 ml) b.i.d. for 14 days.

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Recommended dosage: 20 mg/kg trimethoprim and 100 mg/kg sulfamethoxazole per 24 hours in equal doses every 6 hours for 14 days. See complete product information for suggested children's dosage table.

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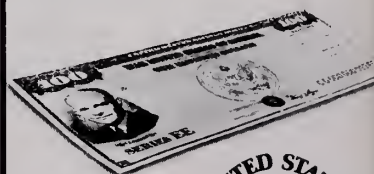
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Pseudosarcomatous Carcinoma

A Pleomorphic Pulmonary Neoplasm

ARLEN R. HOLTER, M.D.;* FRED L. RASP, JR. M.D.† and LEONARD V. CROWLEY, M.D.‡

Pseudosarcomatous carcinomas, a rare type of pulmonary neoplasm, are felt to be of epidermal origin despite their mesodermal appearance. The clinical presentation and histological pathology of such a lesion are detailed in this report.

LIGHT AND ELECTRON microscopic studies of highly pleomorphic pulmonary neoplasms have revealed that these tumors may represent a differentiation from either adeno or epidermoid carcinomas. Recent reports dealing with pleomorphic pulmonary carcinomas have stressed the difficulty in exact characterization of these lesions.^{1,4,10} They may have an epithelial origin but display pseudosarcomatous tendencies to grow in cohesive sheets of giant or spindle shaped cells. This pattern creates the misleading effect of a mesodermal rather than epidermal origin of the tumor.

Such a pleomorphic carcinoma was recently encountered and the clinical and pathological aspects are represented as follows.

Case Report

A 73-year-old white male presented to his physician in December 1981 complaining of a productive cough and a pulling sensation in his lower left chest of three weeks duration. He had experienced a ten (10) pound weight loss over the past three months but denied any respiratory distress, hemoptysis, or constitutional symptoms. He admitted to heavy tobacco usage (56 pack years of cigarettes) as well as industrial exposure to cast iron dust as a tool and diemaker for thirty years.

On admission to St. Mary's Hospital in Minneapolis, his physical examination was remarkable for the absence of any palpable adenopathy. Auscultation of the chest revealed decreased breath sounds at both bases with absent sounds over the left posterior and lateral lung fields. Scattered rhonchi were present bilaterally. Chest Xray (Figure 1) showed a large left lower lobe lung mass with several radiolucencies. Thoracic computerized tomography (Figure 2) confirmed that the lesion was intraparenchymal. Bone and gallium scans demonstrated no other areas consistent with either primary lesion or metastatic spread.

Bronchoscopy was performed on December 11th which revealed the lesion to be in the lateral basilar segment of the left lower lobe. Biopsy material was interpreted as suggesting a malignant fibrous histiocytoma or sarcoma. Mediastinoscopy on December 16th showed the mediastinum to be free of disease. Following several weeks of pulmonary physiotherapy and expectorant treatment

thoracotomy was undertaken on January 8, 1982. A large bulky tumor was resected through an intrapericardial pneumonectomy. Postoperatively, he developed recurrent supraventricular tachyarrhythmias which were treated with Digitalis and Quinidine. He was discharged two weeks following surgery. He did well for three months but died at home in his sleep. No autopsy was performed.

Pathologic Findings

Gross Findings

Examination of the left lung revealed a large gray necrotic tumor mass extending to the pleural surface of



Fig. 1 — AP chest Xray showing large left lower lobe mass.

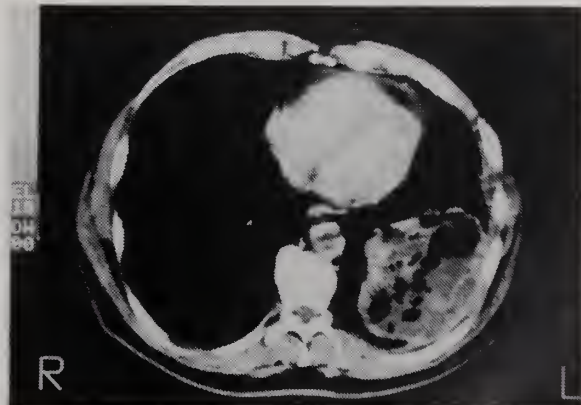


Fig. 2 — Computerized tomogram demonstrating intraparenchymal lesion with areas of central necrosis.

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the lower lobe. The mass measured approximately 12 x 9 x 10 cm. and contained several areas of necrosis and cavitation. Areas adjacent to the tumor showed atelectasis and inflammatory change consistent with microabscess formation (Figure 3). The main bronchus, pulmonary artery and vein were free of tumor.

Light Microscopy

Material for light microscopy was submitted to the Armed Forces Institute of Pathology for Analysis and Consultation (AFIP accession #1828707.8). The tumor cells were quite fusiform with abundant cytoplasm and exhibited marked nuclear irregularities. Prominent spindling with hyperchromatic nuclei and marked mitotic figures was present. In only one of thirty (30) sections was focal epidermoid differentiation seen. A representative section is shown in Figure 4.

Discussion

Pleomorphic or pseudosarcomatous carcinomas consist of predominantly bizarre spindle and/or giant cells which appear to be of mesodermal origin. Extensive histochemical and electron microscopic analysis have shown that these tumors have an epidermoid origin. Battifara's electron microscopic studies of such tumors have demonstrated a gradual transition from sarcomatous appearing areas to true squamous cellular differentiation. He felt that the sarcomatous appearing areas were indeed a mesenchymal metaplasia of squamous cells¹.

Nash and Stout⁹ first described a variety of lung carcinoma that was characterized by an absence of differentiation and highly anaplastic giant cells. Subsequent reports^{4,6} have upheld this separate classification, from squamous cellular, adeno or sarcomatous lesions. The incidence of spindle cell, giant cell and other pseudosarcomatous carcinomas appears to be between 3% and 8% of all primary lung carcinomas^{1,6} whereas one pulmonary sarcoma is encountered per 500 carcinomas⁸.

The tumors attain a large size with central cavitating necrosis and hemorrhage. Often an entire lobe may be involved. Although distant metastases are frequently encountered either during clinical evaluation or at autopsy, none were demonstrated by conventional scanning techniques prior to surgery in this case.

The histologic appearance of pseudosarcomatous

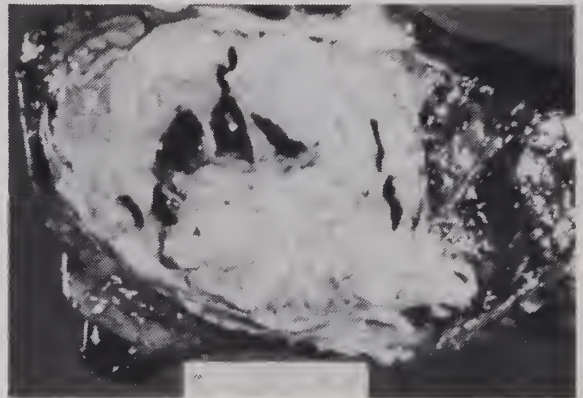


Fig. 3 — Photograph of resected left lung with lower lobe almost entirely replaced by tumor.

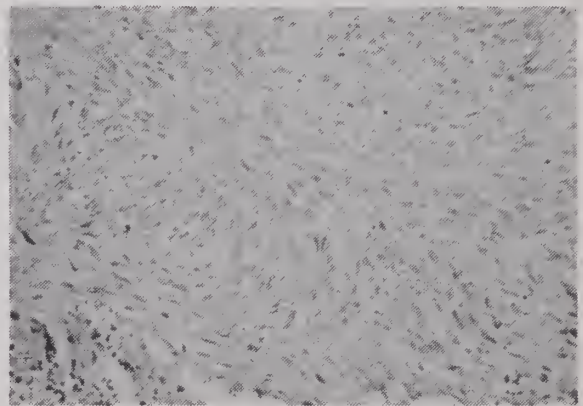


Fig. 4 — Representative light photomicrograph of tumor cells. Whirling pattern gives a pseudosarcomatous appearance.. (H & E x 200)

cells leads to difficulty in differentiating this lesion from a sarcoma^{3,5,8} or malignant fibrous histiocytoma^{2,7}. Indeed the initial bronchoscopic biopsy material was interpreted as sarcomatous. The lack of cellular differentiation in all but one area adjacent to a bronchus made identification of a possible line or origin for the tumor difficult. The spindle shaped cell pattern created the effect of the mesodermal rather than epidermal growth.

The patient's death within five months of the onset of symptoms is typical of the rapid clinical course of this lesion. Gullian and Zelman⁶ reported a mean survival of 6.5 months after the onset of symptoms in twelve patients with similar lesions. The prognostic outlook for pseudosarcomatous carcinomas despite aggressive surgical and adjuvant therapy remains quite dismal.

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Echoes from Our Past

House Calls in the Good Old Days?

JACK D. KEY, M.A., M.S.*

Best known as a writer of detective fiction, Arthur Conan Doyle (1859-1930) was formally trained as a physician, but practiced medicine only for about 10 years. Doyle's *A Study in Scarlet*, published in 1887, launched a spectacularly popular series of crime-solving adventures and successful careers for the master sleuth Sherlock Holmes and his Boswellian partner and deductive foil Doctor John H. Watson. His literary writings were so successful that Doyle from 1891 on turned full time to writing. He took up medicine again only while treating British soldiers in the Boer War in South Africa, a service for which he was knighted in 1902.

An amusing anecdote concerning one of Doyle's experiences when he was a practicing physician appeared in *The Literary Digest* 29(16):508, October 15, 1904. This experience is one with which many physicians should be able to empathize.

—An American lady asked Conan Doyle one day why he had given up the practice of medicine, says the Philadelphia *Bulletin*. He said the work was too hard, and to prove it he went on to tell of his first case:

"My first case came to me in the middle of the night. It was January, and a cold rain was falling. The jangle of the door bell awoke me from a sound sleep, and, shivering and yawning, I put my head out of the window and said, 'Who's there?'"

"'Doctor,' said a voice, 'can you come to Peter Smith's house at once?'"

"'What's the trouble?' I asked."

"'Smith's youngest girl has took a dose of laudanum in mistake for paregoric, and we're afraid she'll die.'"

"'All right, I'll come,' said I."

"'I tramped three miles through the cold and rain to Smith's. Twice on the way I fell on the icy pavement, and once my hat blew off, and in the darkness I was nearly half an hour finding it."

"'Finally, tho, I reached Smith's. But the house was dark — shutters all closed — not a light. I rang the bell. No answer."

"'But at last a head stuck itself gingerly out of a third-story window."

"'Be you Dr. Doyle?' it said."

"'Yes,' said I. 'Let me in.'"

"'Oh, no need to come in, doctor,' said the head. 'The child's all right now. Sleeping very quiet.'"

"'But how much laudanum did you give it?' said I."

"'Only two drops, doctor — not enough to hurt a cat. I guess I'd better take my head in now. The night air is cold. Good-night. Sorry to have troubled you.'"

"'I buttoned my coat and turned homeward, trying as best I could to stifle my mortification and anger. But suddenly the window was raised again, and the same voice cried:

"'Doctor! I say, doctor!'"

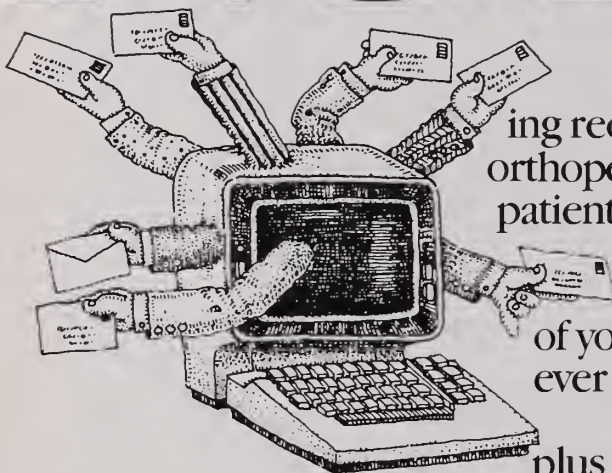
"'I hurried back I thought the child had suddenly taken a turn for the worse. 'Well, what do you want!' I said."

"'The voice made answer:

"'Ye won't charge nothin' for this visit, will ye?'" "

*Librarian, Mayo Clinic, Rochester Minnesota.

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Letter to the Editor

Dear Editors:

I am concerned with the post hospitalization care of the mentally ill in Minnesota, and my reasons for this concern are listed below:

At MSH the longer we keep our mentally ill patients, the better able they are to cope and to stay out of the hospital. This does not always happen with "open" hospitals. Because of the squeeze put on these institutions since the closing of the Hastings and Rochester hospitals, patients are pushed out as rapidly as possible. I believe this is not a good idea.

Many of the patients who come to MSH have a commitment to MSH and some to Corrections as well. This is an advantage to us when it comes to releasing them as we make use of the parole system. We find that Corrections has a better developed system for followup of people released from this system than the Welfare Department has for its discharged patients.

Many released persons in remission from their mental illness go off medication and have relapses. They either are readmitted to the hospital or wind up in some type of skid row situation. This is true even in small towns. If the patient has a caring family, this does not generally happen.

I believe those committed as mentally ill and dangerous fare better than those committed as mentally ill only. The latter are usually discharged within 60 days. After release the red tape involved in extending the treatment beyond 60 days is so great that discharge is preferred. At this point, no one has any responsibility for these patients. Eventually, if they have slipped enough, they will come to the attention of either the police or the welfare department. Unfortunately, at this point the patient is in sad shape. So the process starts again; they are admitted, discharged, put back on the street. Thus, the expression "revolving door" syndrome arose and still has not been solved. Now, that presents the problem. How do we keep the mentally ill patients in the community after hospitalization?

At MSH we see three general types of patients: (1) those who have had one episode of psychosis and never have another. They present no problem unless they have a concomitant character disorder which must be dealt with by other groups. (2) those who have a commitment to MSH and Corrections. As I mentioned above, they are followed-up reasonably well. (3) the chronically mentally ill who do not respond to medication and have a tendency to go off the medication once they are released. They represent the largest and toughest group to handle. Here is where

there needs to be more cooperation between the family, the psychiatrist, and in rural areas, the family physician and the social service department in each county.

Obstacles in this whole process make it difficult to make these "revolvers" stick to treatment . . . and see a physician at suitable intervals.

Medication is the biggest problem. You never know whether or not the patient is taking his medication. There are blood tests to determine whether or not the medication is being taken, but someone has to get the patient to the doctor first to draw blood.

If the patient refuses, the issue can be forced, if committed, but this creates a nasty situation many times. If the patient is not committed, one is faced with an impossible situation, unless a family member will petition for recommitment. Sometimes faced with no other alternative, the patient may cooperate.

Then, there is the problem of the physician. Many non-psychiatrists are too busy with their practices to care for these patients. Someone other than the physician has to be found, and again this creates further problems.

It would be interesting to determine which physicians in the state would be willing to care for the mentally ill. I do not believe we have such a list of physicians, and this might be something for us to work on. Would such a survey of the membership be feasible? It would be very helpful to all workers in the field who deal with these mentally ill patients.

In my opinion, another difficulty lies with the non-committed patient or the discharged patient. Nothing can be forced on him/her, because of civil rights of the patient. Because this group comprises the greatest number of patients we are called upon to care for, the laws need to be changed radically from what they are now, before care and followup can be "forced" upon this group.

I stated above that patients still under commitment represent no problem. This is not always true, as there is still much resistance to adequate followup by social/welfare departments and lack of cooperation from many physicians.

So, what can be done? Change the laws. Also, upon discharge from the hospital, the hospital social service worker should solicit active cooperation from the county social worker and the physician. If a regional mental health service is near by, it can be included. I believe committed and noncommitted patients should all be followed up in this manner.



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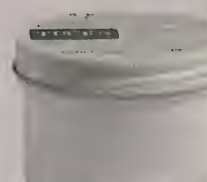
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LETTER TO THE EDITOR

The patient who takes his/her medicine, sees the doctor regularly, and does everything she/he is supposed to do *except* keep occupied is another problem. The patient sits, wanders around town, eats reasonably well, but is a most unhappy person because of having nothing to do. Unless the patient is in a half-way house, there is nothing to help him occupy his time. In the MSH, we gently try to force the patients into some sort of activity. Sometimes this can be accomplished, sometimes, not.

Some patients will not engage in any kind of therapy. If they present no problem, it is better to let

them live in the community. Once they start not taking care of themselves, or eating properly, lose weight, we should rehospitalize these patients immediately.

These are problems as I see them. Another suggestion is to have the County Social Workers prioritize the patients in order of degree of mental illness. They tend to call on the more well ones and not take as much care of the sicker ones (from reports I've had). Obviously, the sicker ones should receive the highest priority and receive the most attention.

Charles G. Sheppard, M.D.
LeSueur, Minnesota

Continuing Medical Education

Bio-Medical Ethics Workshop on Defective Newborns

"To Save or Let Die: Ethical Dilemmas Concerning the Defective Newborn" is the subject of the 1983 Workshop to be presented by the Minnesota Interreligious Committee for Bio-Medical Ethics Wednesday, March 23, 1983, 8:15 A.M.-4:15 P.M., at Beth El Synagogue on Highway 100, 5224 West 26th Street, Minneapolis. Pre registration is required. Fee — \$18.00, lunch included.

Continuing Education accreditation is granted to physicians, lawyers, judges, nurses, clergy and social workers. For further information contact Trudy Rogness Jensen, Chair, 4420 Philbrook Lane, Minneapolis, MN 55424, Telephone: (612) 922-3537. Messages at (612) 869-2403.

This workshop has been approved to meet the criteria for 6 credit hours in Category I of the Physicians Recognition Award of the AMA and in Category I as defined by the Accreditation Council on CME (ACCME).

This workshop has been reviewed and is acceptable for 6 prescribed hours by the American Academy of Family Physicians.

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The Sixth Annual Black Hills Seminar on Advances in Clinical Pediatrics — June 22, 23, 24, 1983, at Sylvan Lake Resort, Custer, South Dakota, sponsored by the Department of Pediatrics and Adolescent Medicine, University of South Dakota School of Medicine. Guest faculty include Drs. C. Warren Bierman, Alvin H. Jacobs, Melvin Levine and Philip Sunshine. For complete conference information contact:

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Blunt Pancreatic Trauma

DIMITRIOS A. LINOS, M.D.;* R. MICHAEL KING, M.D.;† PETER MUCHA, JR., M.D.‡ and
MICHAEL B. FARNELL, M.D.§

Blunt pancreatic trauma is being encountered more frequently. Five patients with significant blunt pancreatic injuries treated at our institution are described. In addition, the literature is reviewed, addressing the various mechanisms of blunt pancreatic injury, its consequences in regard to mortality, and the specific complications of fistulas, pseudocysts, and abscesses.

ONCE BELIEVED to be rare, blunt pancreatic trauma is becoming a more frequently encountered entity because of the increase in high-speed vehicular accidents.^{1,2} Improved prehospital care and earlier transfer of such injuries to centers equipped to handle them have decreased mortality dramatically. The following five cases illustrate some of the common presentations of significant blunt pancreatic injuries.

Case Reports

Case 1

A 37-year-old woman school bus driver struck her abdomen against the steering wheel in an accident. On admission to the emergency room, she was hemodynamically stable but was complaining of epigastric pain, and there was tenderness on palpation over the left upper quadrant. Initial laboratory tests revealed a hemoglobin level of 8.9 g/dl, a leukocyte count of 21,000/mm³, and a serum amylase level of 640 mg/min/L (normal 138 to 404). Diagnostic peritoneal lavage contained 20,000 erythrocytes/mm³, 1,144 leukocytes/mm³, and an amylase content of 1,785 U/L. On the basis of the elevated leukocyte count and amylase level in the peritoneal lavage, abdominal exploration was performed. At celiotomy, free blood was seen coming from a small tear along the falciform ligament of the liver, requiring topical hemostasis. Further exploration of a blood-stained lesser sac revealed a complete transection of the pancreas at a point just above the portal vein (Figure 1 (A)). The duodenum and head of the pancreas were normal. An 80% distal pancreatectomy with splenectomy was performed. The proximal pancreatic duct was ligated, and the distal pancreatic surface was oversewn with a running nonabsorbable suture (Figure 1 (B)). The pancreatic bed and the site of the liver laceration were drained. Post-operative recovery was complicated by chemical pancreatitis, which resolved with medical management. At time of dismissal 20 days later, the patient was tolerating a general diet without evidence of pancreatic exocrine or endocrine insufficiency.

Case 2

A 20-year-old man was injured when struck in the upper abdomen

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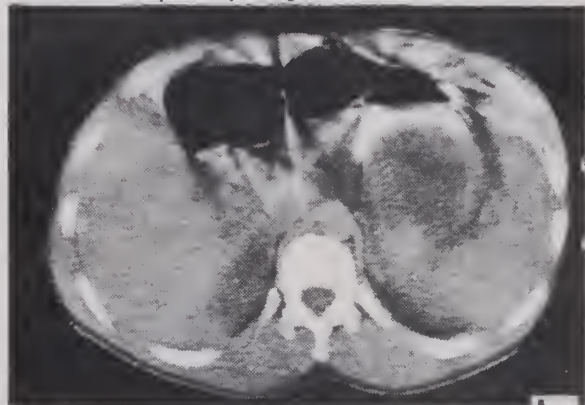


Fig. 1 — (Case 1) (A-top) Complete transection of pancreas just above portal vein. (B-bottom) Ligation of proximal pancreatic duct and oversewing of pancreatic surface.

by the butt end of a hockey stick. He was initially evaluated and hospitalized in his local community for observation and was transferred to our institution two days later because of persistent abdominal discomfort. On admission, he was hemodynamically stable. Examination revealed no external injuries, but there was tenderness in the mid epigastrium, without rebound or guarding. Results of initial laboratory tests obtained in the emergency room were essentially normal, except for a serum amylase level that was six times higher than the upper limit of normal. Abdominal roentgenograms showed no free air, but there were several gas-filled dilated loops of small bowel, as well as dilatation of the ascending and transverse colon.

Traumatic pancreatitis was diagnosed, and nasogastric suction, cimetidine, and parenteral hyperalimentation were instituted. Computed tomography (CT) of the abdomen the following day (three days after the accident) demonstrated a thick-walled cystic mass (8 by 9 cm) in the retrogastric region arising from the tail of the pancreas (Figure 2 (A)). Because of subjective clinical improvement and documentation of a decreasing amylase level, conservative management was continued. Nine days later, the patient had worsening of his abdominal discomfort and developed a palpable cystic mass in the left upper quadrant. A repeat CT scan showed that the cystic mass in the tail of the pancreas had doubled in size while the head and body of the pancreas remained normal (Figure 2 (B)). Surgical intervention was indicated.

At celiotomy, a surprisingly thick-walled pancreatic pseudocyst was found (14 days after injury). It was internally drained by a transgastric cystogastrostomy (Figure 2 (C)). After the operation, the patient recovered rapidly and was dismissed 10 days later. Follow-up CT scan 40 days after the operation revealed complete resolution of the pseudocyst (Figure 2 (D)).



Case 3

A 25-year-old intoxicated man struck his abdomen on a cable while standing snowmobiling. On admission to the emergency room, he was hemodynamically stable. Laboratory tests were unremarkable, including a normal serum amylase level. Peritoneal lavage was done because of equivocal abdominal findings and was positive (erythrocytes 114,000/mm³). A leukocyte count and an amylase level of the peritoneal lavage were within normal limits. Abdominal exploration revealed bleeding from an avulsion of the base of the transverse mesocolon and a serosal tear of the adjacent transverse colon. Although a peri-pancreatic hematoma was present around the head and the neck of the pancreas, careful examination revealed no capsular disruption.

The peripancreatic area was drained. Postoperatively, increasing drainage with a very high amylase content (80,000 U/L) developed on the seventh postoperative day. A pancreatic duct leak was suspected, and endoscopic retrograde cholangio-pancreatogram confirmed disruption of the main pancreatic duct (Figure 3). Continued nonoperative management was maintained with controlled drainage and hyperalimentation. Ensuing hemorrhage from the drains a week later necessitated emergency reexploration, at which time an 80% distal pancreatectomy was performed, along with resection of the autodigested transverse colon. After a complicated postoperative course, he was dismissed a month later on a general diet without the need for insulin or pancreatic enzyme supplementation. Colon continuity was reestablished six months later without incident.

Case 4

A 47-year-old man was involved in a motor vehicle accident, sustaining blunt abdominal trauma and multiple facial lacerations.

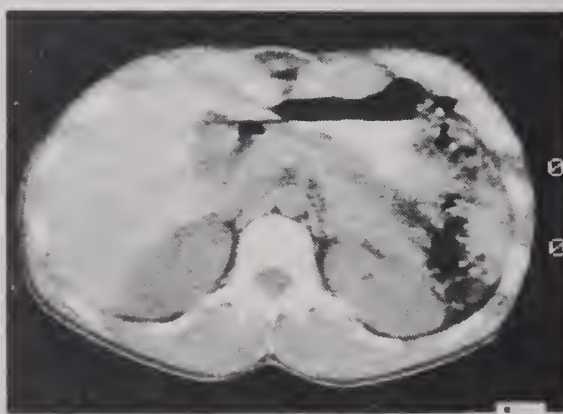
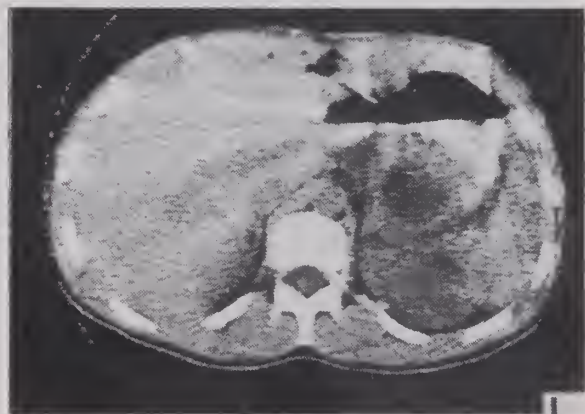
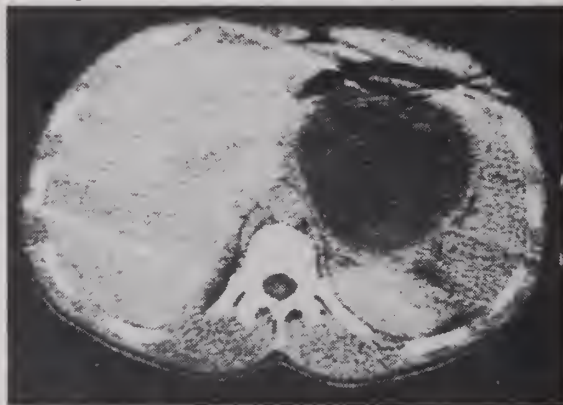


Fig. 2 — (Case 2) (A-top left) Large (8 by 9 cm) cystic mass arising in tail of pancreas. (B-top right) Nine days later, large cystic mass now involving head, body, and tail of pancreas. (C-bottom left) Decompression of pseudocyst by transgastric cystogastrostomy. (D-bottom-right) Forty days after cystogastrostomy shows complete resolution of pseudocyst.

After initial evaluation at a hospital in his home community, the patient was transferred to our institution with severe abdominal pain. Upon admission, his systolic blood pressure was 90 mm Hg. Baseline laboratory studies revealed a hemoglobin level of 11.9 g/dl, alcohol level of 2,110 mg/ml (greater than 1,000 is considered legally intoxicated), and amylase 375 U/L (normal 35 to 115 U/L). A peritoneal tap was performed, which revealed free intra-abdominal blood.

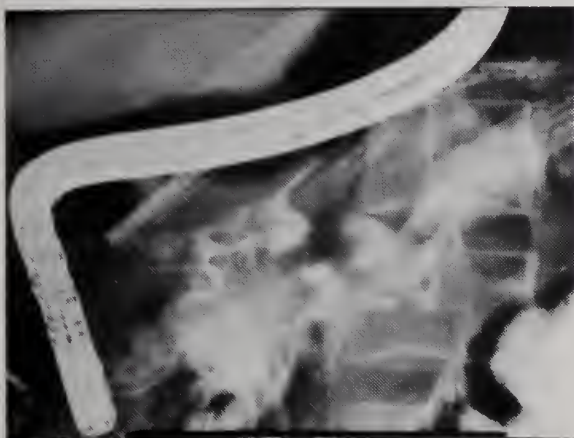


Fig. 3 — (Case 3). Endoscopic retrograde cholangiopancreatogram showing complete disruption of main pancreatic duct.

The patient underwent surgical exploration, which revealed a complete disruption of the first and second portions of the duodenum just distal to a previous pyloroplasty (15 years ago), extensive lacerations of the head of the pancreas, and partial avulsion of the uncinate process (Figure 4). A pancreaticoduodenectomy was performed, dividing the pancreas just to the left of the portal vein. After completion of a Roux-Y loop pancreaticojejunostomy, a cholecystojejunostomy was performed because of the inflammatory reaction of previous surgery and a small-caliber common bile duct. For decompressive purposes, a T-tube jejunostomy was placed between the pancreaticojejunostomy and the cholecystojejunostomy.

After a stormy immediate postoperative course, the patient developed progressive obstructive jaundice because of inadequate biliary decompression via the cholecystojejunostomy, in spite of intraoperative cholangiographic confirmation of patency of the cystic duct into the remaining common bile duct. Three weeks after the initial Whipple procedure, reoperation was performed, at which time a cholecystectomy and a choledochojejunostomy was established with the now dilated common bile duct. At dismissal, the patient had no evidence of exocrine or endocrine insufficiency.

Case 5

A 31-year-old intoxicated man involved in a motor vehicle accident was transferred for further evaluation of an acute abdominal condition after initial care in his home community. Peritoneal tap revealed gross free blood. At abdominal exploration, there was a deep hepatic laceration along the falciform ligament and partial avulsion of the gallbladder. More impressive was a complete transection of the pancreas to the right of the portal vein, along with a complete disruption of the common bile duct from the duodenum (Figure 5). Cholecystectomy and pancreaticoduodenectomy were performed. A meticulously constructed choledochojejunostomy was stented with a small T-tube. The patient had an uneventful convalescence and was dismissed from the hospital on the 25th postoperative day.

Mechanism of Injury

In most series, less than 2 or 3% of blunt injuries to the abdomen involve the pancreas. Sixty percent of

automobile-related pancreatic injuries are caused by striking the steering wheel.³ There are several mechanisms of blunt pancreatic trauma. When the blunt forces are concentrated to the right of the vertebral bodies, the head of the pancreas may be crushed, often with hepatic lacerations, avulsions of

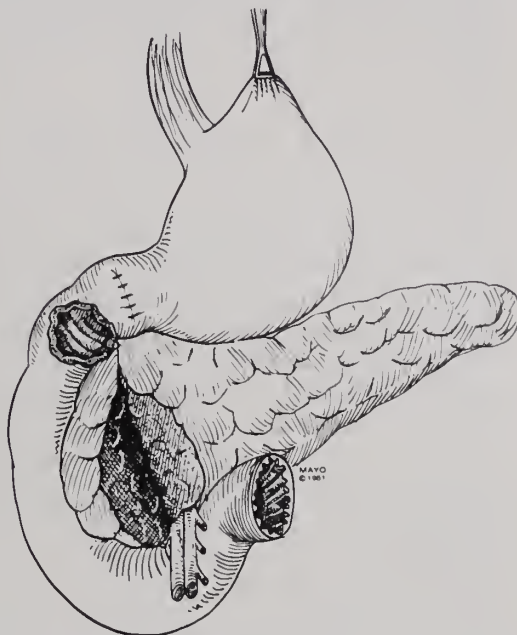


Fig. 4 — Diagram showing disruption of first and second portions of duodenum, with extensive lacerations of head of pancreas.

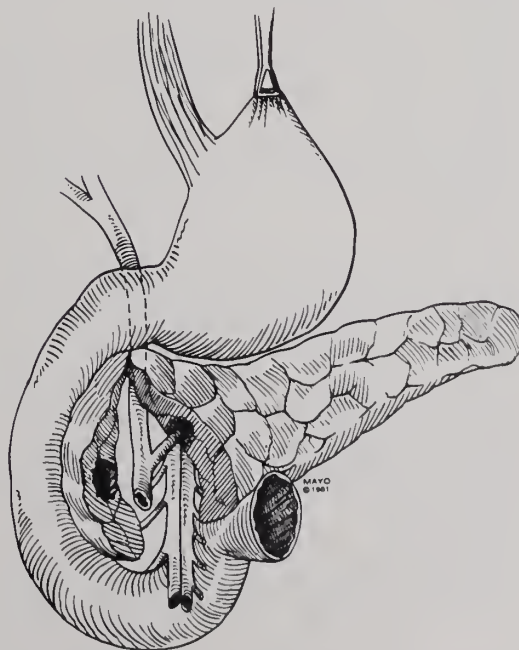


Fig. 5 — Diagram showing complete transection of pancreas to right of portal vein and complete disruption of common bile duct from duodenum.

the common bile duct, and rupture of the duodenum. When the blunt abdominal trauma is concentrated in the midline, where the pancreas normally crosses the vertebral bodies, the classic pancreatic transection injury is often produced, frequently without associated injuries. If the impact forces are directed to the left of the vertebral bodies, distal pancreatic contusions and lacerations with associated splenic lacerations may occur.

Consequences of Pancreatic Trauma

Mortality

A recent collective review of 1,091 cases of pancreatic trauma⁴ from institutions reporting more than 50 cases revealed an overall mortality of 21%. The mortality rate was 23% for penetrating injuries and 18% for blunt trauma. Death was primarily related to associated injuries of adjacent major blood vessels, duodenum, or colon. Half of the deaths among the patients with pancreatic injuries reviewed by Northrup and Simmons¹ were caused by hemorrhage, 16% by renal failure, and 12% by sepsis. Only 9% of all the deaths in their series were caused by the pancreatic injury itself.

Although the injured pancreas alone is rarely the cause of death, it can significantly contribute to mortality and morbidity. The effect of vascular injuries, for example, may be compounded by additional intravascular volume loss into the inflamed pancreas and peripancreatic tissues. Baker and colleagues³ reported that, on admission to the hospital, 12 of 16 patients with acute blunt pancreatic injuries had hematocrit levels greater than 50%, suggesting significant loss of plasma into and around the traumatized pancreas. Moreover, gastrointestinal injury resulting in a release of enzyme activators, such as enterokinase, may be compounded by activated pancreatic secretions, breaking down enterorrhaphies that ordinarily would heal in the absence of pancreatic juices. Furthermore, released pancreatic juices containing activated proteolytic enzymes and vasoactive substances may, in the presence of gastrointestinal spillage, favor bacterial population by providing a culture medium in the form of devitalized tissue, making it impossible for the traumatized patient to control infection.

Complications

The specific complications of pancreatic injury are, for the most part, the result of inadequate control of exocrine secretion. Such inadequately controlled secretion produces three specific complications: pancreatic fistulas, pseudocysts, and abscesses.

Fistulas are more frequent with blunt injuries than with penetrating injuries, probably because of the difficulty in recognizing capsular lacerations or ductal disruption in the diffusely traumatized retroperitoneum. Pancreatic head injuries result in fistulas far more often than tail injuries.^{5,6} The volume of the gland injured seems to be the most significant determinant in the development of a fistula. Most of these fistulas are minor and transient, usually persisting for less than four weeks. Northrup and Simmons¹ pointed out that minor fistulas should not be considered a complication of inadequate treatment of the pancreatic injury. They are instead the desired and inevitable consequence of adequate drainage of the severely injured pancreas, which is necessary to prevent the more serious complications of pancreatic pseudocysts and abscess formation. Werschky and Jordan⁷ stated that only two of the 40 patients in whom fistulas developed in their series of 115 patients with pancreatic trauma ultimately required operation to control the fistula. Operation in both was successful. In seven of the 40 patients with pancreatic fistulas, spontaneous closure occurred as late as nine weeks postoperatively — five of these patients had persistent fistula secondary to blunt trauma.

Northrup and Simmons¹ noted pancreatic pseudocysts in approximately 10% of all injuries. Interestingly, pseudocysts were documented in one-third of the survivors after blunt pancreatic trauma. This high incidence after blunt injury is probably related to the rather casual approach taken by most surgeons regarding the drainage of nonpenetrating pancreatic injuries. There is good support for the thesis that adequate drainage of the disrupted pancreas should prevent pseudocyst formation. In a large series of 300 patients, Jones⁴ reported that no pseudocysts had developed in the last 237 patients with pancreatic injuries treated since 1963. This success was attributed to thorough visualization and drainage of the pancreas at the time of surgery.

Abscesses after pancreatic injury are less frequent than fistulas or pseudocysts, with a reported rate of only 1%. A rate of 8% is seen for patients with blunt pancreatic trauma.¹ Like fistulas, the occurrence of abscess formation has decreased when surgical drainage is performed.

Diagnosis

Clinical Findings

The early diagnosis of blunt pancreatic and duodenal injury is difficult. The retroperitoneal location masks the classic clinical signs and symptoms of intra-

abdominal sepsis, thus causing a delay in recognition. Such delay allows the incipient development of both local inflammation, which impairs technical repair, and systemic sepsis, which significantly increases postoperative morbidity and mortality from multiple-organ failure. Unfortunately, this unwarranted delay in diagnosis, especially beyond 24 hours,⁸ leading to a delay in surgical intervention, is the single most important factor for increased morbidity and mortality. An early diagnosis of blunt pancreatic injury depends on a high index of suspicion and the recognition of early abdominal physical findings.

A history of trauma may be the only clue to the diagnosis of pancreatic injury. Signs and symptoms may be totally absent. In fact, in patients with isolated blunt pancreatic trauma, clinical manifestations of the injury typically develop slowly.^{1,8} Symptoms have been reported to be absent for as long as five days, even after complete pancreatic transection,^{9,10} and for as long as 92 hours after avulsion of the pancreatic and biliary ductal system from the duodenum.¹¹ Symptoms in isolated blunt trauma may be delayed until a pseudocyst develops weeks, months, or years later.¹² Letton and Wilson¹³ have proposed that the delay in symptoms with isolated pancreatic injuries results from the failure of pancreatic enzymes to be activated in the absence of associated visceral injuries. Another factor may be the absence of peritoneal irritation because the inflammatory process takes place in a confined retroperitoneal location. Not until the peritoneal wall is itself inflamed will these signs become clinically impressive. The symptoms are mild and physical signs may be absent. Often minimal abdominal pain and tenderness are present immediately after injury, but these usually decrease during the subsequent one or two hours, only to become worse again within six hours.⁸ This transient diminution in clinical findings may give "a false sense of security" to the examining physician, who misinterprets this injury as abdominal wall contusion. Intoxicated patients or patients with associated head injury pose additional problems in clinically assessing the presence of pancreatic injury.

Diagnostic Tests

Amylase. — Although it was believed that pancreatic injuries usually could be diagnosed if serum or urine amylase levels were elevated,¹ such elevated levels often may be misleading. Olsen¹⁴ found that only 8% of trauma patients with hyperamylasemia had pancreatic injuries. A study by Moretz et al.¹⁵ concluded that there was no correlation between elevated serum amylase level and pancreatic injury and

that decisions as to the advisability of operation should be based on other parameters.

In another series, White and Benfield¹⁶ correlated serum and urine amylase values with clinical data from 63 patients who had pancreatic trauma. They found that, although preoperative hyperamylasemia was an unreliable index of pancreatic trauma, postoperative assessment of urinary amylase levels was a reliable indicator of continuing postoperative pancreatitis. Urinary amylase (diastase) levels were elevated immediately after laparotomy in 93% of their patients with pancreatic injury. Also, when nasogastric suction was discontinued postoperatively in patients who had become essentially asymptomatic and yet still had elevated urinary amylase levels, 11 of 14 such patients developed recurrent signs of pancreatitis. Therefore, intensive treatment including nasogastric suction should be continued, even in asymptomatic patients who demonstrate persistent elevation of urinary amylase levels.

While several studies advise that exploratory laparotomy should not be done for possible pancreatic injury on the basis of elevated amylase levels alone, the detection of hyperamylasemia in asymptomatic patients who have sustained blunt abdominal trauma cannot be dismissed. These patients should be hospitalized and closely observed. A serum amylase determination should be repeated six hours after the initial determination on admission. According to Lucas⁸ ". . . a rise in serum amylase levels at six hours in a patient with minimal or moderate abdominal tenderness is very significant and warrants laparotomy". In the future, fractionation of an elevated serum amylase into (s) salivary and (p) pancreatic isoenzymes may prove to be an even more objective diagnostic tool.

Peritoneal Lavage

Diagnostic peritoneal lavage is indicated in patients with equivocal abdominal findings after blunt trauma. If the lavage is positive,¹⁷ celiotomy should be performed.

However, while a positive diagnostic peritoneal lavage is helpful, a negative lavage is unreliable in ruling out retroperitoneal injuries.¹⁸ Most patients with blunt retroperitoneal pancreatic injuries do not have associated intraperitoneal injury⁸; therefore, peritoneal lavage is not a sensitive technique for diagnosing pancreatic injuries.

Other Studies

Two other diagnostic studies — visceral arteriography and endoscopic retrograde cholangiopan-

creatography (ERCP) — have been used to detect pancreatic injury. Arteriographic studies may show vascular injuries in the region of the pancreas which definitely indicate the need for surgical exploration. ERCP, when available, can demonstrate occult pancreatic injury, disruption of a major pancreatic duct, and/or associated bile duct injuries. Application of these techniques are often logistically limited in emergency situations.

The potentials of another noninvasive, highly sensitive, diagnostic modality — computed tomography — have just begun to be utilized for retroperitoneal trauma. Based on available data from studies on nontraumatic pancreatic and retroperitoneal lesions,¹⁹⁻²¹ CT of the abdomen should prove to be a promising diagnostic option for suspected pancreatic trauma.

Surgical Treatment

The mainstay of surgical treatment of patients with possible pancreatic injury is thorough visualization of the pancreas at the time of exploration. Northrup and Simmons¹ stressed that significant pancreatic injury, including complete transection, has been overlooked because of inadequate exploration of the gland. The entire pancreas should be visualized. The head of the pancreas and the duodenum can be completely mobilized to the midline by performing a Kocher maneuver. The gastrocolic omentum is also divided in order to enter the lesser sac and view the entire body of the pancreas. The tail of the gland can be mobilized by freeing the spleen and retracting it medially along with the tail of the pancreas, thus allowing direct visualization and palpation of both sides of the distal portion of the gland. Any retroperitoneal hematoma in the peripancreatic region is considered presumptive evidence of pancreatic injury and demands meticulous exploration.

Control of hemorrhage at the time of initial exploration is essential. Fogelman and Robison²² have reported that the "bleeding pancreas not primarily controlled is never controlled." Bleeding vessels in the pancreas are exposed by carefully debriding surrounding devitalized tissue sufficiently to gain secure hemostasis by precise placement of shallow mattress bites of fine nonabsorbable suture.

Determining the extent of pancreatic injury will dictate the appropriate management. According to Lucas,⁸ pancreatic injuries can be classified into four classes.

Class 1

Simple pancreatic contusion without capsular or ductal disruption and without persistent hemorrhage

requires simple drainage with several large Penrose drains or closed sump (suction) drains placed directly at the site of pancreatic contusion and brought out through the abdominal wall along a short direct tract. These drains should exit through an incision in the upper flank, which is placed as dependently as possible and made sufficiently large enough to easily admit two fingers. Although drainage from the pancreas might not be expected with a simple contusion and an apparently intact pancreatic capsule, a minor capsular disruption may have been easily missed, and lack of drainage to such areas could result in abscess formation. Simple pancreatic lacerations with noted capsular disruption but without loss of tissue or major ductal injury are best treated by simple closure of the capsule with nonabsorbable material and drainage. Suture of the pancreatic capsule, when possible, may discourage formation of fistulas, but data are insufficient to substantiate this statement. In any event, extensive drainage to control leakage from a pancreatic injury is definitely more important than attempting to prevent the fistula by capsular repair.

Several authors^{23,24} have stressed the importance of establishing drainage in all pancreatic injuries by the use of Penrose and/or sump drains. Anderson et al.²³ found that the complication rate was 64% among 17 patients with Penrose drainage alone, 20% among five patients with sump drainage alone, and 10% among 31 patients with both Penrose and sump drainage. Drains should remain in place for at least seven to 10 days. More recently, we have found large-caliber "closed" suction drains (Jackson-Pratt or Hemovac) to be effective in conjunction with sump drainage.

Class 2

Patients with major lacerations, fractures, or intraparenchymal hematomas of the body and tail of the pancreas are best treated by distal pancreatectomy with splenectomy.⁸ The modern day emphasis on splenic preservation may warrant distal pancreatectomy without splenectomy when technically feasible. In order to discourage fistula formation, the main pancreatic duct, if visible, should be ligated using a transfixion suture of fine nonabsorbable suture. The cut surface of the transected proximal pancreas is oversewn with interrupted, interlocking, mattress sutures of nonabsorbable suture, thus facilitating hemostasis. The stump of the pancreas should be drained.

It has been suggested⁷ that, after resection of the distal pancreas, the end of the remaining gland should be anastomosed to a defunctionalized Roux-Y limb of jejunum instead of being managed by direct ligation of

the duct, oversewing of the stump, and external drainage. Patients with pancreatic trauma, in contrast though to patients with diseased pancreatic tissue, usually have normal antegrade flow so that retrograde leakage from the resected margin is infrequent. Therefore, routine Roux-Y pancreatojejunostomy is not indicated except in two relatively uncommon instances: (1) in patients requiring secondary operations after pancreatic injury because of a persistent major pancreatic fistula and (2) in patients undergoing primary distal pancreatectomy for trauma when there is severe contusion and edema of the remaining pancreatic head. In either instance, impairment of the antegrade flow can be anticipated.

Good results after treatment of injury to the body or tail of the pancreas involving the main pancreatic duct have been reported by many authors.^{4,7} Yellin et al.²⁵ performed distal pancreatectomy in 60 patients for injuries of the pancreas. In eight patients, the pancreatic injury was located considerably to the right of the superior mesenteric vessels (in the pancreatic head), and 13 to 15 cm of distal pancreas were resected. Diabetes mellitus developed in only one patient after distal pancreatectomy. This patient was one of five patients in whom 15 cm of distal pancreas were removed. In dogs, Yasugi et al.²⁶ demonstrated that hyperglycemia did not occur with less than 70% resection. Hyperglycemia did occur though immediately after 88% pancreatectomy. With resections between 70 and 88%, hyperglycemia developed six weeks to seven months later. This would indicate that diabetes mellitus might not be detected during the immediate hospitalization of patients undergoing major resection for pancreatic trauma.

Frey and associates,²⁷ reviewing their experience with 77 patients who underwent 80 to 90% pancreatectomies for chronic pancreatitis, showed that many of these patients had unstable postoperative problems with endocrine and exocrine pancreatic insufficiency. Therefore, they advised that only 40 to 80% distal pancreatectomies be performed. A controversial option to preserve pancreatic function in an injured gland that would require more than 75% resection is the double pancreatojejunostomy. In this procedure, a defunctionalized limb of the jejunum is anastomosed to both proximal and distal ends of the transected pancreas.⁴ Another option is the oversewing of the proximal end of the transected pancreas and anastomosing the distal segment to a limb of jejunum, as first described by Letton and Wilson.¹³ However, most authorities believe that simple resection of the distal pancreas is preferable if less than 75% of the gland is removed.

Class 3

Patients with severe laceration, transection, intraparenchymal hemorrhage, or contusion of the head of the pancreas in the absence of major duodenal injury are best treated by the duodenal diverticulization procedure if the main pancreatic duct is uninvolved.⁸

The Berne duodenal "diverticulization" procedure²⁸ consists of "diversion of the alimentary stream" away from the injured duodenum and pancreatic head. Such diversion is done by removing the gastric antrum, closing the duodenal stump, and performing a Billroth II gastrojejunostomy and vagotomy. The duodenal laceration is closed with interrupted nonabsorbable sutures and is decompressed with a tube duodenostomy to reduce the possibility of disruption of the suture line from increased pressure within the duodenal stump.

In their original paper, Berne et al.²⁸ reported a mortality rate of 16% for 50 patients with such grave injuries who underwent this procedure.

Class 4

With pancreatic injuries involving severe combined pancreaticoduodenal disruption, the selection of treatment is based on the integrity of the main pancreatic duct. Injury to the main pancreatic duct can be identified at operation by leakage of pancreatic secretions at the site of injury or by extraductal extravasation of a contrast agent. Duodenotomy and retrograde cannulation of the ampulla of Vater permit the intraductal injection of a radiopaque dye or one of the blue dyes, which will stain the pancreatic tissues if the duct is disrupted. Alternatively, if facilities are available, intraoperative oral fiberoptic retrograde cannulation of the pancreatic duct may be performed. These techniques permit the surgeon to accurately assess whether or not the main pancreatic duct is disrupted. If the duct is intact, the duodenal diverticulization procedure is preferred, whereas if the duct is disrupted, the pancreaticoduodenectomy (Whipple procedure) is recommended.

Yellin and Rosoff²⁹ used pancreaticoduodenectomy in 10 patients with severe combined pancreaticoduodenal injuries. Only four patients survived, and all four had early major postoperative complications. In a collective review of 60 patients reported in the literature, Yellin and Rosoff found that the average operative mortality rate was 35%.

Summary

A strong clinical suspicion, accurate identification of the extent of injury, and choice of appropriate treatment are important in decreasing the mortality and

morbidity after pancreatic trauma. The history of the trauma may be the only clue to the diagnosis of the pancreatic injury. Signs and symptoms may often be absent owing to the retroperitoneal location of these injuries. Diagnostic tests such as urinary and serum amylase and peritoneal lavage may aid in the evaluation of patients with suspected blunt pancreatic trauma. In other patients, visceral arteriography and endoscopic retrograde pancreatography may be useful. Computed tomography of the abdomen may prove to be an invaluable diagnostic tool in defining the retroperitoneal injury.

At celiotomy, the pancreas must be carefully examined to determine the extent of injury. In turn, the injury can be classified according to severity from the simple contusion to complete pancreaticoduodenal disruption. According to the extent of injury, appropriate surgical management of such injuries can be

performed. In patients with simple contusion of the pancreas, drainage alone may be all that is necessary. In patients with disruption of the pancreatic parenchyma without associated duodenal disruption, pancreatic resection, ranging from a distal to a total pancreatectomy depending on the location, may be done. With extensive combined pancreaticoduodenal trauma, duodenal diverticulization is advised when the main pancreatic duct is intact, while a pancreaticoduodenectomy or Whipple procedure is usually required when there is ductal disruption.

The implication of a serious pancreatic injury with all of its inherent complications justifies familiarity with a rather complex choice of management and therapeutic decisions. At present, the necessary expertise may be available only at major centers. Early transfer of patients with such pancreatic injuries is highly recommended.

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HB E Disorders in a Minnesota Southeast Asian Immigrant Population: Morphology, Indices, Electrophoretic Patterns and Clinical Manifestations

LINDA M. SANDHAUS, M.D.,* CLARK M. SMITH II, M.D.,† LOANN PETERSON, M.D.‡

Hemoglobin E ($\alpha_2\beta_2^{26}\text{Glu-Lys}$) is one of the most prevalent hemoglobin (Hb) variants in the world, and is seen almost exclusively in the Southeast Asian population. Homozygous Hb E and Hb E traits are benign conditions; however, coexistence of Hb E and thalassemia may result in severe anemia. In view of the influx of persons with Hb E, these hematologic disorders are worthy of increased awareness.

HEMOGLOBIN E (HB E) is one of the most prevalent hemoglobin variants in the world, and is seen almost exclusively in the Southeast Asian population. The incidence of Hb E in Southeast Asia ranges from 2% in Vietnam¹¹ to approximately 35% in Laos and some

areas of Cambodia.^{10,12} In the last few years, approximately 20,000 Southeast Asian refugees have immigrated to Minnesota; 60% of the refugees are Hmong, 20% Lao, 15% Vietnamese and 5% Cambodian. In view of the influx of persons with Hb E, this hemoglobinopathy and its interaction with other hematologic disorders are worthy of increased awareness. The purpose of this report is to emphasize the spectrum of Hb E conditions seen in an immigrant population in Minnesota. The electrophoretic findings,

This work was performed at Hennepin County Medical Center, Minneapolis, Minnesota.

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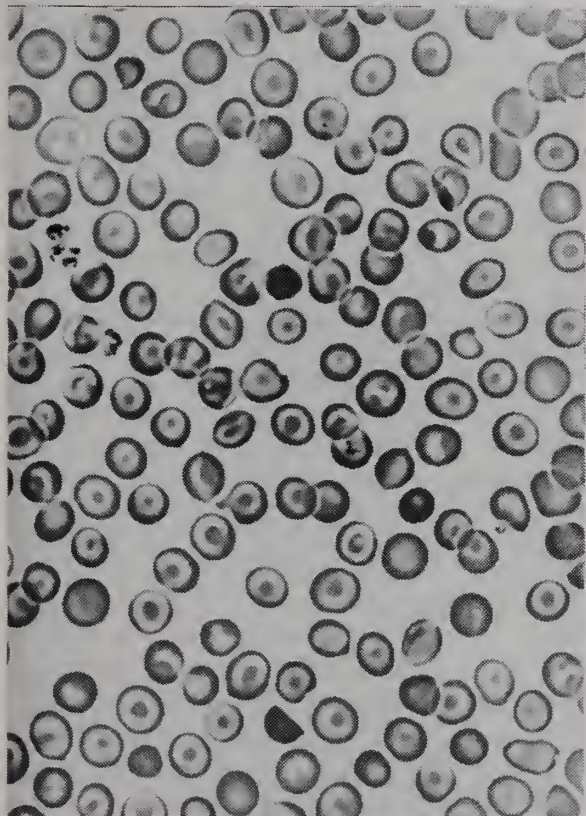


Fig. 1 — Blood smear from Patient 1 with Hb EE with microcytosis and prominent target cells. Wright stain. X 640.

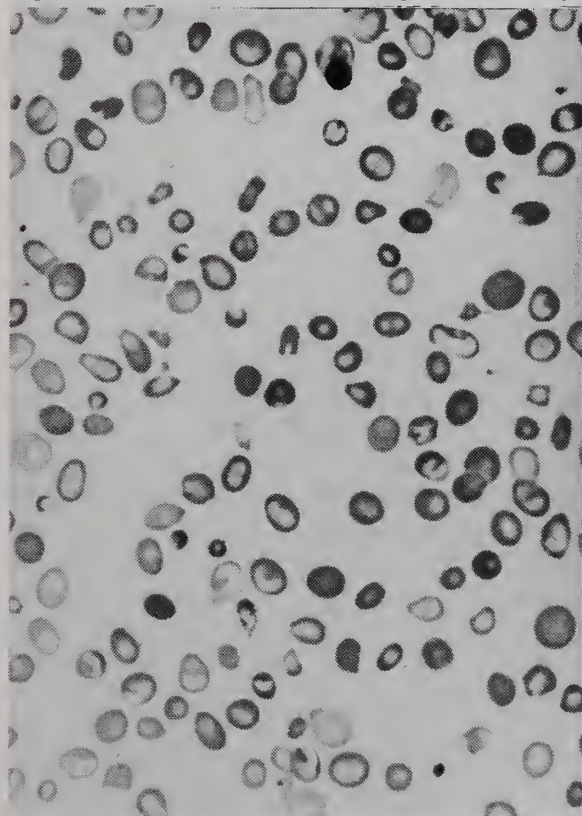


Fig. 2 — Blood smear from Patient 28 with Hb E- β^0 -thalassemia with severe anemia, marked aniso-poikilocytosis, and circulating normoblasts. Wright stain. X 512.

indices, morphologic features, and clinical manifestations of homozygous Hb E (Hb EE), Hb E trait, Hb E- β -thalassemia, and Hb E- α -thalassemia are presented.

Materials and Methods

A total of 42 patients with hemoglobin E were identified between July 1980 and March 1982 at the Hennepin County Medical Center. Thirty of these were greater than six months of age and comprise the patient population of this study. Twenty-four patients were Lao, five were Vietnamese, and one was Cambodian.

Blood specimens were anticoagulated with EDTA-sodium and hematologic data were obtained on a Coulter S+ automated cell counter. Hemoglobin electrophoresis on cellulose acetate at pH 8.6 and on citrate agar at pH 6.4 were performed in all cases.¹³ Electrophoresis with isoelectric focusing was done in six cases.¹⁴ The relative hemoglobin percentages were determined by densitometry with confirmation of elevated Hb F by radial immunodiffusion (Hb F Quipate Kit, Helena Laboratories) in two cases. The available electrophoretic techniques did not allow separation of Hb A₂ from Hb E, and therefore, all stated values for Hb E in this study include Hb A₂. Serum iron concentration and total iron-binding capacity or serum ferritin or zinc erythrocyte protoporphyrin were obtained in 18 cases.

Results

It should be noted that the patient categories that are presented do not reflect the true incidences of these disorders, since screening of the total population was not done.

Homozygous Hemoglobin E

Nine adults (> 18 years of age; seven males, two females) with probable Hb EE were identified. The predominant hemoglobin in these patients was Hb E with absence of Hb A. Two patients had slightly elevated Hb F percentages (4-5%). Three of the nine patients had normal hemoglobin values. The other patients had hemoglobin values that were only mildly decreased, the lowest being 10.4 g/dl in a 25 year old male. Six of the patients had an erythrocytosis ($5.49 \times 10^{12}/l$ - $7.88 \times 10^{12}/l$). Marked microcytosis was present in all the patients, with mean cell volume (MCV) ranging from 57.3 to 66.2 fl. The major morphologic features of the Hb EE condition were microcytosis and target cells (Figure 1). Although there was variability in the number of target cells from case to case, a mean of 42% (7%-67%) target cells was present. Occasionally coarse basophilic stippling was

seen (two patients). Splenomegaly was absent in all patients, with the exception of one patient who had hepatitis.

The hematologic parameters in three children identified with Hb EE reflected the tendencies seen in adults. In two infants, six months old and eight months old, the Hb F values were elevated (16% and 30% respectively) with the remainder of the hemoglobin migrating as Hb E. MCVs as low as 45.2 and 48.8 fl in these two infants were observed.

Iron studies were performed in five of the adults and one of the children and were normal.

Hemoglobin E Trait

Ten adults (seven females, three males) were identified as having Hb E trait. The percentage of Hb E for these patients ranged from 28-35% with a mean of 31%. Anemia was not a feature of Hb E trait. Four of the ten patients had an erythrocytosis ($5.57 \times 10^{12}/l$ to $6.36 \times 10^{12}/l$). Seven of the patients had a microcytosis (MCV 65.8 fl to 79.7 fl). The blood smears were characterized by mildly microcytic red cells with occasional target cells. On the average, only 2% (< 1% to 10%) of the erythrocytes were target cells. Basophilic stippling was absent. Splenomegaly was absent in all patients. Iron studies were performed in five of the patients and were normal.

Four children, ages six months to two years, were identified as having Hb E trait. For these patients the percentage of Hb E ranged from 25%-30%; Hb F was mildly elevated (3-9%) in three of the four patients. Two children were mildly anemic, however they were both iron deficient. Microcytic indices were present in all four children and one child, discussed below, had an erythrocytosis.

One of the children with Hb E trait, a nine-month old boy, had a Hb of 10.7 g/dl, a MCV of 58.0 fl and a mild erythrocytosis. Iron studies were normal. The low percentage (25%) of Hb E in this patient suggested the possibility of mixed heterozygosity for Hb E and α -thalassemia. Family members were available for study. The mother appeared to be a straight-forward Hb E heterozygote with 35% Hb E. A presumed diagnosis of α -thalassemia trait in the father was supported by the observation of persistent microcytosis (MCV = 73.0 fl) with a Hb of 13.6 and a normal Hb electrophoresis, quantitative Hb A₂, serum ferritin and zinc erythrocyte protoporphyrin. The family study and low Hb E percentage suggest that this child represents the double heterozygous condition, Hb E- α -thalassemia.

Hb-E- β -Thalassemia

Two children were evaluated for severe anemia. The

children exhibited frontal bossing, gnathism (maxillary overgrowth) and marked hepatosplenomegaly. They had received intermittent transfusions in their homelands, but no definitive diagnosis of their conditions had been made. One child was a 15-year old girl who had a Hb of 5.5 gm/dl, a red cell count of $2.95 \times 10^{12}/l$, and a MCV of 56.0 fl. The other child was a 12-year old boy who had a Hb of 6.4 gm/dl, a red cell count of $3.15 \times 10^{12}/l$, and a MCV of 63.0 fl. Hemoglobin electrophoresis yielded 76% Hb E and 24% Hb F in the girl, and 69% Hb E with 31% Hb F in the boy. The diagnosis of Hb E- β^0 -thalassemia was made in these patients based on the clinical presentations, the electrophoretic pattern including absence of Hb A, and elevated serum ferritin levels. The mother of the girl had high A α - β -thalassemia, but the father was not available for study. Neither parent of the boy is alive.

The blood smears from patients with Hb E- β^0 -thalassemia showed a marked hypochromic, microcytic anemia with marked anisopoikilocytosis characterized by numerous tear drop forms and target cells (Figure 2). Basophilic stippling and nucleated red cells were also present. These patients have been transfusion free since their arrival in the U.S. (approximately 2 years), and are able to go to school and engage in moderate activity.

The diagnosis of Hb E- β^+ -thalassemia was made in two patients. One patient was a 34-year old man who presented with INH-induced hepatitis. The other patient was a 32-year old pregnant woman who was admitted for delivery of her child. Serum iron was normal in the man, but was decreased in the woman. Splenomegaly was not present in either case. In the man the Hb electrophoresis yielded 60% Hb E, 22% Hb F and 18% Hb A. Hemoglobin F was present in a heterogeneous distribution in the erythrocytes. In the woman the Hb electrophoresis yielded 77% Hb E and 23% Hb A; Hb F was undetected. These patients had mild microcytic anemias (Hb 12.1 and 11.3 gm/dl; MCV 65.8 and 69.6 fl, respectively) with normal red cell counts. Blood smears showed moderate microcytosis, moderate aniso-poikilocytosis with target cells, tear drop forms, elliptocytes and basophilic stippling.

Discussion

Hb E is a common hemoglobin variant in Southeast Asia^{2,6,10,11,12,16} but has been seen only rarely in the United States. Fairbanks reported the first series of North American cases of Hb E when he reported two cases of homozygous Hb EE in 1980³ and 21 cases of Hb E trait in 1979.⁴ This paper demonstrates the wide

spectrum of Hb E conditions seen in a Southeast Asian immigrant population in Minnesota and includes Hb E thalassemia disorders. In our series of 30 patients with Hb E disorders, 12 patients had probable homozygous Hb E (Hb EE). This condition was characterized by mild or absent anemia with normal or elevated red cell counts and marked microcytosis. The blood smears showed predominantly microcytic target cells and occasional basophilic stippling. In Fairbanks' report of two persons with pedigree documented Hb EE, microcytic indices and target cells were observed, but anemia was not present.⁴ In our series, three of the six adults who were anemic had documented normal iron studies, suggesting that Hb E alone may cause anemia.

In the heterozygous Hb E condition, anemia was essentially absent. In contrast to the marked microcytosis and erythrocytosis in Hb EE, mild microcytosis and erythrocytosis characterized the Hb E trait. These findings confirm those of Fairbanks, who reviewed the hematologic parameters in 21 cases of Hb E trait.³ In addition, blood smears were reviewed on all our patients with Hb E trait, and were distinguishable by the relative paucity of target cells in the heterozygous condition as compared to the homozygous state.

Alpha-thalassemia may be the most prevalent hemoglobin disorder in Laos¹² and therefore, one would expect to see Hb E- α -thalassemia interactions frequently. Previous authors have noted that there is a consistent decrease in the percentage of Hb E when this trait is associated with α -thalassemia.¹⁶ In our series, one patient with probable Hb E- α -thalassemia was identified by the low percentage of Hb E and family studies.

Four patients with Hb E- β -thalassemia were seen; two with Hb E- β^0 -thalassemia and two with Hb E- β^+ -thalassemia. The patients with Hb E- β^0 -thalassemia presented in early childhood with a clinical syndrome characterized by severe anemia and extramedullary hematopoiesis. These children have required episodic transfusions, but were never transfusion dependent. Hemoglobin electrophoresis demonstrated Hb E and Hb F with complete absence of Hb A. Morphologically their blood smears were characterized by severe hypochromic microcytic anemia with marked aniso-poikilocytosis, circulating normoblasts, and basophilic stippling, similar to β -thalassemia major. The two patients with Hb E- β^+ -thalassemia had mild anemia, mild microcytosis, and blood smears that showed moderate aniso-poikilocytosis. These patients were asymptomatic and lacked evidence of extramedullary hematopoiesis.

Previous authors have emphasized the heterogeneity

of patients with Hb E- β -thalassemia.^{5,7,9,12} Some of this heterogeneity may be explained by the fact that some patients have β^+ -thalassemia and some β^0 -thalassemia. However, much of the heterogeneity certainly reflects the multiplicity of genetic mechanisms that have been postulated to explain the β -chain deficiency in β -thalassemia.⁸

Investigations of the molecular biology of Hb E have provided some insight into the complexity of the Hb E-thalassemia interactions. Recent studies have shown that the β^E gene results in inefficient synthesis of β^E -globin chain which is due to decreased β^E -globin mRNA, similar to the mechanism for β -thalassemia.^{1,15} This mechanism explains the decreased production of Hb E in affected individuals and their phenotypic similarity to β -thalassemia trait. In cases of Hb E- β -thalassemia, the thalassemic effect of the β^E gene would appear to compound the severity of

the coexisting β -thalassemia gene, resulting in a greater severity of the clinical syndrome.

In our cases designated "probable Hb EE", family studies were generally unavailable or were inadequate to rule out entirely the possibility of interacting β -thalassemia genes. Two of the patients included in this study are parents of 2 children with Hb EE. Therefore, the diagnosis of Hb EE in these two patients is supported by the apparent homozygosity for Hb E in their offspring.

In view of the rising influx of persons with Hb E, these hematologic disorders and their interactions are worthy of increased awareness. Identification of persons with Hb E is important because of the potential severity of the Hb E- β -thalassemia condition. Equally important is the recognition that Hb EE and Hb E trait are benign conditions which resemble mild β -thalassemia minor.

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Does Continuing Medical Education Affect Medical Care

A Study of Improved Transfusion Practices

SEYMOUR HANDLER, M.D.*

We have attempted to show that continuing medical education (CME) can alter physician practice in the narrow area of transfusion practices. This report describes a CME endeavor in educational terms — needs assessment, educational content and evaluation. Needs assessment predominantly involved the education of the teachers — pathologists in this case — that the teaching of transfusion practices is a worthwhile project and amendable to improvement. Educational content included formal conferences, medical staff peer review committee activity, and individualized instruction of physicians. Evaluation was accomplished for us, accidentally, by an outside independent agency (FHCE). We believe we have demonstrated that CME can alter medical practice, in this instance improve transfusion therapy.

THE QUESTION OF the yield of continuing medical education (CME) in improving medical care has stimulated a vigorous debate.¹⁻³ After years of effort, expenditures of billions of dollars, voluntary and now mandatory attendance, the question is finally posed: we have no clear answers.

Educators equate the value of CME with behavioral change in physicians; presumably this means that physicians practice better medicine. In order to demonstrate improvements in medical practice resulting from CME, the process of CME should be examined. Educators describe this process in terms of needs assessment, educational content and evaluation. That's fine talk for educators. Physicians prefer: (1) finding out what the physician wants or needs to learn, (2) the educational content, and (3) finding out what the physician has learned. When the educational process is examined — described preferably in language physicians understand — the intrinsic value of community hospital-based CME becomes apparent.

This study will attempt to describe a fruitful CME experience at a community hospital in educational terms. This CME endeavor involves transfusion practices at North Memorial Medical Center (NMMC). We will attempt to demonstrate that NMMC transfusion practices are superior to other comparable institutions and that this result is the culmination of 20 years of educational efforts on the part of the attending

pathologists. The CME effort will be described in classical educational terms: (1) needs assessment, (2) educational content, and (3) evaluation.

Needs Assessment

Needs assessment in adult education is determining what the students — physicians in this case — believe they should learn. For continuing medical education, educators utilize a variety of techniques, including formal surveys, intuition, medical lounge discussions, all of which add up to one thing — keeping one's ear to the ground or one's hand on the pulse of medical practice. In this particular CME effort to improve transfusion practices, the problem was the students' lack of perception of a need. Pathologists at NMMC perceived this educational need because we were convinced that many blood transfusions were administered unnecessarily. Not only did we perceive this need, but we also recognized that transfusion practices were a form of medical discipline amendable to improvement and worthy of the effort.

Pathologist responsibility for the blood bank or transfusion service at a community hospital is limited in the Minneapolis area. Our excellent regional blood bank† provides most of the logistical support and professional skill in blood bank problems. In most instances, the final question relating to transfusion therapy are referred to us by blood bank technologists. Problems arise when the regional center's inventory is low, or where transfusion demands at our institution create inventory problems in particular blood groups.

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Intuitively, we learned that if less blood was requested for transfusion, the logistical problems proportionately decreased. That was a start in our education. However, the inventory problems which occasionally plagued us were not unique to our institution; we were certainly not singled out by the regional bank.

The next step in our (pathologists in this case) education was the observation that, no matter how dire the blood loss emergency in any particular case, the patients rarely died of blood loss. We experienced hundreds of instances of bleeding peptic ulcers, ruptured ectopic tubal pregnancies, traumatized spleens, obstetric emergencies, etc., clinical situations recognized as potentially lethal solely from the aspect of blood loss. In these massive hemorrhage situations, many units of blood were requested of the blood bank and transfused. Although some patients died of blood loss, these cases were usually clinical disasters without apparent potential for salvage. Examples include massive trauma from automobile accidents, ruptured arteriosclerotic aortic aneurysms, lethal gunshot wounds, etc.

Included in these bleeding emergencies were instances where the patient's blood group created inventory problems; AB or B, Rh negative, is always in short supply. Somehow we got by; either the regional facility obtained units from other hospitals, or we occasionally gave Rh negative patients Rh positive blood, etc. As the years went by, with the exception of hemorrhage situations where salvage was unlikely in any event, our patients were not dying of blood loss. Why? Are we that good; is our regional blood center that efficient in supplying blood; is our patient population uniquely resistant to lethal blood loss? The answer to these questions is negative. The truth is that most situations perceived as potentially lethal because of blood loss are exaggerations of a problem, a product of a lack of understanding of the ability of the body's defense mechanisms to compensate for massive blood loss.

Why have surgeons and other physicians responsible for bleeding patients not understood the significant compensatory mechanisms protecting patients from lethal blood loss? Surgeons are human and hemorrhage is a dramatic event in the operating room. When the operative field wells up with blood from an uncontrolled bleeder, the surgeon's adrenaline flows, and he benefits from the security of rapid blood replacement. Most often the exciting episode is brief, and when comparing blood loss for that case to other similar procedures, blood loss is not too different. For reasons unclear to this author, the unique compensatory mechanisms instituted by the body in hemorrhage are

not adequately appreciated. Surgical texts and abundant literature^{4,5} have addressed these compensatory mechanisms. Nevertheless, the fact that transfusions are administered in situations where they are not needed indicates that understanding of these mechanisms is incomplete.

What is the pathophysiology⁴ of massive blood loss? Significant blood loss results in active and passive reduction of the vascular bed. This purposeful reduction preserves adequate venous return to the heart so that cardiac output is sufficient to perfuse tissues. The capacity of the body to maintain perfusion in major blood loss is far greater than generally appreciated. The body readily compensates for blood loss in amounts of 1500 to 2000 ml, occasionally requiring a little assistance with balanced electrolyte infusions. Measured blood loss up to 30 percent of blood volume is well tolerated in most surgical patients. Blood transfusions are rarely required but unfortunately are administered with much less blood loss, usually as arbitrary replacement.

Within 24 to 36 hours after surgical blood loss, as the intravascular volume is repleted by extravascular fluid, the hemoglobin (and the hematocrit) concentration in the blood drops; the decrease is proportional to the blood volume lost. Is this relatively acute anemia a problem to the patient? In the vast majority of instances, postoperative dilutional anemia due to plasma refill is not a problem to the patient unless the physician creates one. Almost as fast as blood volume is replaced — 24 to 36 hours — red blood cell 2,3-DPG increases, permitting red cells to release more oxygen to tissues with each trip around the body. Further, does the postoperative patient require unusual supplies of oxygen? There is no evidence⁶ to suggest that the usual surgical patient, resting in bed, has an increased oxygen requirement. Our oxygen reserve may be as much as five or ten times that needed at rest. The postoperative surgical patient is not running a marathon. He probably is doing very little more than what he does when he sleeps. A major requirement is perfusion of tissues, and in the plasma refill phase of the first 24 to 36 postoperative hours, intravascular volume returns to the preoperative state rapidly and tissues are adequately perfused. Indices of adequate perfusion are maintenance of blood pressure and pulse, good urine output, warmth of the skin, clear mental state, etc. The hemoglobin concentration tells the clinician nothing about perfusion; neither is it indicative of reduced oxygen delivery to tissues.⁶

Problems arise when the physician notes reduced hemoglobin values on the chart in the first few postoperative days. As Fairbanks⁷ has stated, "Re-

duced hemoglobin values cause more symptoms in the attending physician than in the patient." Even though the patient is doing well by almost every parameter (except the hemoglobin concentration), the surgeon may be disturbed by the reduced hemoglobin, being concerned that active bleeding may be occurring. All too often, without assessing the presence or absence of active bleeding, the surgeon's anxiety is translated into an order for blood transfusions. The surgeon should ask himself whether the anemia postoperatively is a problem to the surgical patient. It certainly does not retard wound healing.⁸⁻¹⁰ It does not contribute to infection. The patient's convalescence is not prolonged. Indeed, the major problem of postoperative anemia may be the surgeon's anxiety.⁴ The surgeon should look at the patient, determine that the patient is doing well in terms of perfusion, and largely ignore the laboratory report of reduced hemoglobin. If the hemoglobin on discharge is below normal levels, and the patient's iron stores are not considered adequate to regenerate sufficient hemoglobin, hemoglobin determination may serve as an index of need for oral iron therapy. However, the normal male ordinarily has sufficient iron to regenerate the hemoglobin in four units of blood.

How low can hemoglobin concentration drop in the surgical patient postoperatively before action is required? The answer is not specifically addressed in the literature.¹¹ Except for abundant experimental evidence in animals,¹² wartime trauma¹³ and experience with Jehovah's Witnesses, routine civilian surgery has not been adequately studied. Studying massive surgical hemorrhage without blood replacement apparently requires more courage than most surgeons can muster; it is difficult to subject patients to such studies. Nevertheless, sources of convincing data are available.

First, studies on Jehovah's Witnesses¹⁴⁻¹⁶ are most convincing that major blood loss during surgery can occur without blood replacement (but with adequate fluid replacement) and without increased morbidity or mortality. Gollub,¹⁵ studying a series of Jehovah's Witnesses with major general and cardiovascular surgery, receiving only crystalloid intravenous fluids, found that acceptable results could occur despite massive blood loss and no blood replacement. Since post-dilutional hematocrits averaged 19 percent in Gollub's patients, we may assume that blood loss occurred in the two to three liter range, about half the patient's blood volume. The patients did well; the only aberration noted was pallor. However, "pallor" is not a patient symptom or problem; only the observer is disturbed by "pallor".

Even more impressive is Cooley's¹⁶ work on Jehovah's Witnesses; 36 Witnesses had elective aorto-coronary bypass surgery. Intraoperative blood loss was replaced by Ringer's lactate solution. Thirty-four patients did well; two postoperative deaths were unrelated to blood loss. Hemoglobin decreased from a preoperative mean of 15 gm/dl to 9.2 gm/dl on the seventh postoperative day. Some of the patient hemoglobins declined to between 6-7 grams postoperatively. Convalescence was uneventful, demonstrating that major surgical blood loss can occur without blood replacement and with optimum morbidity and mortality. Perhaps not everyone can equal the surgical skill of Cooley, but the ability of his Witness patients with massive blood loss to do well without replacement transfusions should be instructive to all surgeons.

The work¹⁷ of the U.S. Army Surgical Research Unit on volunteers studied the ability of healthy young adults to withstand blood loss, with or without Ringer's lactate fluid replacement. In volunteers subjected to 20 percent (over one liter) venesection, crystalloid fluid replacement completely maintained prehemorrhage blood volume, the correction achieved by increased plasma volume. Despite the infusion of large volumes of electrolyte solution, the increased plasma volume had normal serum albumin concentration, indicating that colloid osmotic pressure is unchanged and that large infusions of electrolyte solution do not predispose to pulmonary edema.¹² Although some surgeons may be reluctant to extrapolate from experimental work in healthy young volunteers to their patients, the evidence indicates that perfusion and blood volume are easily maintained with crystalloid solutions following major blood loss.¹⁸

Uncontrolled experimental work on massive blood loss is available from experience with Vietnam battle injuries. Crystalloid solutions were used in massive amounts. After stabilization, some casualties had hematocrits about 10 percent and did well. Similar experimental work has been done in baboons,¹² rapidly bleeding them and diluting them down to hemoglobin levels one-fourth of normal, and without any mortality.

Possibly most convincing is experience derived from our own clinical practice. The following cases are selected from many, indicating that surgical blood loss and postoperative anemia in a surgical patient can be well tolerated, with no increase in morbidity, and a perfectly benign postoperative course.

A 56-year-old widow had massive upper gastrointestinal hemorrhage due to a benign gastric ulcer. The initial hemoglobin on admission was 7.9 gm/dl. She received multiple blood and plasma transfusions. She continued to bleed actively and antrectomy was

performed. Immediate postoperative hemoglobins varied between 9 and 10 gm/dl. She had received 14 units of blood preoperatively and intraoperatively. Because of a known anti-Kell antibody from multiple prior hip reconstruction procedures, she received only Kell-negative blood.

She did well postoperatively. On the third day, when the hemoglobin was 9.9 gm/dl, an attending physician wrote, "How about one more unit of packed cells. She looks pale." Her surgeon elected to not transfuse. On the sixth day, red urine was noted, determined to be free hemoglobin. Subsequently, until the ninth postoperative day, her hemoglobin dropped to 3.8 gm/dl. Urine and plasma were wine red; the patient was jaundiced; conjugated bilirubin was 1.7 and total bilirubin 6.9 mg/dl; plasma hemoglobin was elevated; direct Coombs was positive; reticulocytes were 25%. The patient did well and was discharged on the 12th day with a hemoglobin of 6.5 gm/dl. At her six-week visit, her hemoglobin was 13 gm/dl.

Antibody studies revealed an acquired anti-c in addition to the known anti-Kell. The patient was c-negative; of the 14 units transfused, 12 were c-positive. We assume she lysed 12 units of red cells, leaving her with the two c-negative units and her own cells. Blood for this patient was impossible to obtain; other lesser antibodies had developed. Throughout this worrisome period of increasing anemia and jaundice due to hemolysis, the patient had an uneventful course. She ambulated well, and you may imagine how this extremely anemic and jaundiced patient appeared. She was not transfused because compatible blood was not obtainable; yet she did well.

The above case indicates how extremely anemic a postoperative patient can become and yet heal the wound adequately, avoid infection, and have an otherwise uneventful postoperative course. Although we would not recommend permitting postoperative anemia of this level, in this case, we had no choice. When we learned the nature of the hemolytic anemia, that it was due to an acquired anti-c, we were able to convince the apprehensive attending physicians that the patient would survive without additional blood replacement. The very smooth postoperative convalescence of this patient was a major item of education for all attending physicians.

An example of a patient's ability to sustain blood loss of over 50 percent of blood volume without significant risk follows.

A 16-year-old female had a tonsillectomy and adenoidectomy; preoperative hemoglobin was 12.5 gm/dl. Surgical blood loss was moderate. Late on the day of surgery, the patient noted blood trickling down the back of her throat. She subsequently had an emesis of 1200 ml of blood and gastric juice hemoglobin on the emesis was 10.5 gm/dl. She subsequently had another one-liter bloody emesis. She was dizzy in the upright position but asymptomatic when reclining. Urine output and mental state were normal. She received only intravenous balanced electrolyte solutions. Very late in the day of surgery, a bleeder in the tonsillectomy bed was controlled. Subsequent hemoglobins approximated 6.5 gm/dl, indicating that she sustained a 50 percent blood volume loss. She was discharged on the second post-operative day on oral iron therapy, and at her six-week visit, the hemoglobin was 13 gm/dl.

The case illustrates the very significant capacity of the patient with major blood loss to maintain perfusion without blood replacement, and to subsequently have an uneventful postoperative course. During the time of

active bleeding, the only compromise to adequate perfusion was in the upright position. This was readily corrected by laying her down. The attending physicians did not desire to subject a young nulliparous female to blood transfusion, a wise decision to minimize possible sensitization for a subsequent pregnancy.

The following cases are examples of imprudent transfusion therapy, not recognizing that the patient's symptoms were unrelated to anemia, and in which transfusion therapy may well have been harmful.

A 44-year-old man with advanced Hodgkin's disease had a hemoglobin of 8.2 gm/dl and white blood count of 2000. In an attempt to improve his severe dyspnea, the patient was slowly given two units of packed red cells. During the second unit transfusion, he had a dramatic increase in dyspnea, the lungs filled up with rales, and he died. Autopsy revealed massive Hodgkin's disease replacement of the myocardium. Transfusion of two units of packed cells, albeit slowly, overwhelmed his cardiovascular system because cardiac filling could not occur. The anemia was not causing the patient a problem.

A 56-year-old woman became dyspneic running to catch a bus. She had had several weeks of increasing fatigue and epigastric distress. She appeared pale and her hemoglobin on admission was 3.1 gm/dl. Stools were positive for occult blood, red cells were severely microcytic and hypochromic and she had very low serum iron. Upper GI x-ray revealed a giant gastric ulcer. In a 48-hour period, she received eight units of blood, raising her hemoglobin to 12 gm/dl. She underwent partial gastric resection for benign ulcer. Four hours after surgery, she had a massive stroke and died. Post mortem examination revealed an infarcted cerebral hemisphere due to an acute thrombus of the internal carotid artery, that artery entirely free of atherosclerosis.

The second case exhibits excessive haste in attempting to correct anemia for which the patient has already adjusted. Perhaps two or three units of packed cells would have been in order. The patient should have been allowed to permit her system to adjust before elective surgery. If the patient was able to run to catch her bus with 3 grams of hemoglobin, why was it necessary to create an emergency where one did not exist? She could have had surgery two or three weeks later while on medical management for benign gastric ulcer. Indeed, excessive haste created an emergency, entirely to the detriment of the patient.

Non-Surgical (Chronic) Anemia

Anemias developing chronically due to any etiology are associated with normal blood volume and increases in plasma volume corresponding to the decrease in red cell mass. Consequently, the effects of hypovolemia do not occur, and the only untoward effects for the patient are due to tissue anoxia. Because the physiological adjustments are so effective, tissue hypoxia is prevented except in the most extreme circumstances. Patient symptoms, if any, relate to the physiologic adjustments to anoxia, rather than the anoxia itself.

Some of the adjustment is automatic, requiring no

effort or strain on the patient, and therefore causing no symptoms. Decreased viscosity of anemic blood permits improved perfusion without strain on the heart. Increased 2,3-DPG within red blood cells permits increased delivery of oxygen to tissues. Some of the adjustment poses a potential strain on the patient. Tachycardia and tachypnea occur, the heart's attempt to move fewer blood cells around the body more quickly and the lungs' attempt to improve oxygenation of red cells. However, these compensatory mechanisms rarely cause symptoms in the patient except at extremely low hemoglobin concentrations, and even then, requiring exertion to elicit symptoms. We have had abundant experience with the older, white-haired, blue-eyed woman of Scandinavian descent who complains of dyspnea climbing two flights of stairs to retrieve something from her attic. When this patient with pernicious anemia has a measured hemoglobin of 3-4 gm/dl, "the physician has more symptoms than the patient." Indeed, attempts (transfusions) to correct such a chronic anemia are the greatest risk to these severely anemic patients.

What are the hemoglobin concentrations in chronically anemic patients which are associated with any symptoms? In an otherwise normal person, hemoglobin levels between 9 and 11 gm/dl rarely cause symptoms except with extreme exertion. Above 7 gm/dl, healthy persons are asymptomatic at rest. Many patients with hemoglobins around 3 gm/dl have no dyspnea at rest; only below 3 gm/dl is dyspnea at rest regularly experienced. Cardiac failure occurs between 2.0 and 2.5 gm/dl. Complaints of weakness rarely are heard until the hemoglobin is below 8 gm/dl. Much of the above is well supported by the elegant studies by Elwood¹⁹⁻²¹ in England in populations of women with iron-lack anemia due to menstrual blood loss. Symptoms of anemia did not occur in patients until the hemoglobin was below 8 gm/dl. In fact, anemic patients with hemoglobins above 8 gm/dl, and who corrected to normal with oral iron therapy, achieved no demonstrable change in symptoms as elicited by an elaborate questionnaire.

The most dramatic evidence for the ability of the chronically anemic patient to physiologically compensate for anemia derives from experience²² with chronic renal dialysis patients. Early in these programs, arbitrary transfusion practices existed. When patients presented at the dialysis center, if their hematocrit was below 22 percent, they received one unit of packed red blood cells; below 19 percent, 2 units. The result of this arbitrary practice was escalating crossmatch problems and transfusion reactions with no discernible difference in patient symptoms. The level of azotemia

correlated far better with patient symptoms than the degree of anemia; whether the patient's hemoglobin was 5 or 10 gm/dl did not matter. Accordingly, as the logistical problems of transfusing these uremic patients became overwhelming, the practice of transfusing dialysis patients only if they had unquestioned symptoms of anemia became standard practice. These symptoms include dyspnea with moderate exertion and lightheadedness when erect. If the patients did not have symptoms of anemia, they were not transfused, almost at any level. The result was that the patients gradually leveled out at a hemoglobin level determined by their limited ability to replace red cells, often at levels hovering about 4 gm/dl. The patients did as well as their uremia would allow, did not suffer from anemia, and above all, avoided much of the problems and expense associated with routine blood transfusions.

As we learned the pathophysiology of surgical blood loss and chronic anemia, and at the same time saw transfusions administered repeatedly without addressing physiologic indications, we wondered what motivated physicians to order transfusions. The reasons are several, but basic to all was a lack of adequate knowledge of the pathophysiology of anemia, both acute and chronic, and the compensatory mechanisms involved. This lack of knowledge became the stimulus to our CME efforts to improve transfusion practices.

Why have physicians not been better educated in transfusion practices? Possible explanations are complex but involve questions of philosophy and personality in addition to lack of knowledge of the pathophysiology of blood loss and chronic anemia. Physicians by nature are oriented to action. Rather than not do something, physicians are more comfortable doing something when they perceive an abnormality in their patients.

Ordering a blood transfusion is inherently easier than going through the mental process of deciding (an overt negative decision) not to transfuse. In surgical blood loss or significant anemia, transfusion action is accepted and applauded. In rare instances is the physician asked to justify the decision to transfuse. As we will subsequently see, the question and its answer are major parts of the educational process.

Another philosophic reason for the decision to transfuse is avoidance of risk. If a surgical patient is bleeding, why should the surgeon (or anesthesiologist) subject himself to the risk of the patient going into irreversible shock. A perfectly acceptable approach is to administer blood; no one could be criticized for that and it may well be the proper thing to do. The same applies to the physician attending the patient with

pernicious anemia or iron-lack anemia with a hemoglobin of 5 or 6 gm/dl. The patient might have a coronary attack or a stroke and the physician could be criticized for not vigorously correcting the anemia. He fears criticism and possible legal action for not taking action more than he fears criticism for any possible complications of unnecessary transfusions. Again, action is more acceptable than inaction, and complications of action more forgiven than complications of inaction.

Medical school curriculums and residency training are notoriously lacking in education on transfusion practices. Except for specific hematinic therapy, medical students learn little or nothing about indications or contraindications to blood transfusion. Indeed, although they learn all about component therapy and wisely choose packed red cells over whole blood, the decision to transfuse in the first place is not an educated one. Similarly, in surgical training, tremendous gaps exist in transfusion practices. In the past, surgical fellows followed the pronouncements of their chief of service. Famous chiefs have been known to say "blood was replaced cc for cc" or "my patients go to surgery with 14 grams hemoglobin", etc. Such demonstrations of ignorance of the pathophysiology of blood loss and the need to transfuse was common in surgical fellowships. More recently, surgical residents are better educated.

Adverse Transfusion Reactions

In addition to the far more important consideration of transfusion indications, concern for adverse reaction²³ to transfusions deserves attention. If anything is stressed during medical school or residency training, transfusion reactions are likely to be covered. Although most transfusion reactions are more bothersome than dangerous, lethal or potentially lethal reactions occur. As a result, blood bank and transfusion service procedures and discipline have evolved to an extremely high level, frequently to the amazement of our clinician and nursing colleagues who are astounded at the fuss we make to keep transfusion practices safe. We who are in charge of blood banks in community hospitals do not want to harm the patient and the seemingly endless patient and unit identification procedures we insist upon have worked in minimizing serious hemolytic reactions.

Most transfusion reactions are more a nuisance than a serious threat to patients. Poorly understood allergic or leukocyte antibody reactions are often at fault, particularly in patients who have had many transfusions. In addition to the serious reactions due to blood group incompatibility, bacterial contamination of

blood, volume, overload, etc., we are increasingly concerned about virus contamination of blood. Hepatitis B is now effectively excluded as a risk with proper donor screening. However, non-A, non-B hepatitis is not screened and has become the major source of hepatitis transmitted by blood transfusion. In addition to hepatitis, transmission of cytomegalovirus is a recognized²⁴ complication of blood transfusion. Although first recognized in multiple unit transfusions for cardiovascular surgery, we now recognize that any transfusion can transmit the virus and cause illness of varying severity. With the increasing recognition of acquired immune deficiency syndrome, in which cytomegalovirus has been incriminated, further concern for causing harm with unwarranted transfusion should be voiced.

The worst disasters occur with fatal transfusion reactions in situations where the transfusion could have been avoided with reasonable consideration. These catastrophes could be minimized by drastic reduction of administration of blood transfusions. It is my personal opinion that the number of blood transfusions given could be reduced by 75 percent and patient care would not suffer.

Educational Content

The second phase of the adult education process is the educational activity itself. In this particular CME activity to improve transfusion practices, a significant part of the education process occurred in the needs assessment phase, in which the educators (our pathology group) learned the science of transfusion practice. With our education and an inherent activist philosophy in medical care, teaching transfusion practices was an automatic sequel.

The educational process simply represented telling the clinicians what we learned about the science of transfusion practices, whether for surgical blood loss or chronic anemia. As the reader may recognize, there were several obstacles to this educational endeavor as well as several factors in our favor.

Our greatest difficulty was attempting to correct a problem which the physicians did not perceive. The natural instinct of many of our clinical colleagues was, "Get off it. I know when to transfuse without your telling me". What we were trying to accomplish was to reverse medical school and residency education (or its absence). Another obstacle derived from the pathologist's status as a non-clinician; we are not directly responsible for the care of the patient. As a result, we were frequently accused of "being so smart; you're not responsible for the patient" or "the lawyer

will blame me if the patient dies — not you''.

Positive factors contributing to our effectiveness in educating physicians in transfusion practices are several. Of major importance in our situation is the responsibility for CME delegated to our pathology group; we organize and administer CME. The educational responsibility for CME permits us to include transfusion practices regularly as subject matter for educational conferences. A second factor is our responsibility for regular review of blood transfusions on the Surgery Committee and similar review for other services. Also, because we professionally supervise the hospital blood bank, the medical staff looks to us as experts on blood products and transfusion practices. All physician complaints about the transfusion service are addressed to us. Finally, and possibly the most important of all in our ability to influence transfusion practices, is the general precept that with knowledge comes power. By educating ourselves in the science of transfusion practices, we achieved a high level of professional acceptance by our clinicians. If they disagreed with us on a particular transfusion indication, we could discuss (or argue) the case with facts. Eventually, as the physicians educated themselves by paying attention to transfusion practices in their patients, the need for forceful emphasis diminished.

The educational process, traversing a period of approximately 15 years, was entirely unplanned and never considered as a particular goal of CME at our hospital. Education on transfusion practices evolved casually, and only looking back on the process can we see its merit as a truly fruitful CME endeavor. For the sake of an outline, the process will be discussed in terms of formal educational conferences, medical staff committee transfusion review, and informal one-to-one education of the individual physician. Your presumption that the latter was most effective is correct.

Formal Conferences on Transfusion Practices

Over an approximately 15-year period, educational conferences have been presented which contributed to understanding of anemias, blood loss emergencies, blood bank functions, component therapy, etc. Although not specifically designed with the CME goal of improving transfusion practices, the knowledge presented (and apparently retained in significant amounts) created a level of understanding which permitted us to use more specific approaches to modify the use of blood transfusions. Some of the presentations were also modified for use with paramedical groups involved in transfusions — nurse anesthetists,

operating room nurses, intensive care nurses, medical technologists, nursing in-service education, etc. The education was not limited to one hospital. Presentations on transfusion practices were given to medical staffs at other metropolitan and out-state community hospitals.

The emphasis at many of these conferences was not specifically directed to the reduction of blood transfusions; yet the effect was the same. For example, we discussed the diagnosis and management of iron-lack anemia, emphasis given to the lack of symptoms specifically referable to the level of anemia¹⁹. We emphasized that inexpensive simple iron salts rapidly corrected the most common iron-lack anemias and that the more expensive or complex therapies such as all-purpose hematinics, sustained-release iron, parenteral iron or blood transfusions rarely played a role. More specifically related to the body's physiological adjustments to anemia was a presentation on oxygen transport, with particular emphasis on intraerythrocytic 2,3-DPG²⁵. A specific conference on surgical blood loss described the immediate compensation of the body to maintain adequate perfusion and the surprising ability of balanced electrolyte solutions ("white blood") to maintain circulating blood volume^{15,16}. Also contributing to this fund of knowledge were presentations on component therapy, optimal use of the blood bank, the "universal donor", transfusion reactions, etc. Repeatedly, as the subjects were presented at regular intervals over almost two decades, our medical staff became quite sophisticated in the science of transfusion practices and were most amenable to our more individualized efforts to modify the use of blood transfusions.

Formal Peer Review

The monthly Surgery Committee meetings have included transfusion review as a regular agenda item. One of the pathology groups developed a systematic review performed by the medical records section. This review includes the type of surgery, amounts and types of transfusions administered, preoperative hemoglobin values and date of surgery. The monthly screening of the summary by the pathologist serving on the Surgery Committee readily detected deviation from usual practice worthy of more detailed chart study. During recent years, most transfusions for surgical blood loss were used for open heart surgery, major pulmonary resection and more radical intra-abdominal procedures for tumors. Some of the most advanced orthopedic reconstructive procedures receive blood transfusions on occasion. Most gynecologic surgery rarely received blood replacement. In fact, our excellent experience on

most major surgery provided the basis for a highly successful type and screen technique which replaced most routine crossmatches.

As the pathologist detected instances of blood transfusions in operative procedures which rarely required transfusion, those charts were pulled for more detailed examination. In most instances, the operation was more complicated than initially suggested and transfusions were deemed indicated. The rare cases where the indication for transfusion was not immediately apparent from review of the chart were presented to the Surgery Committee for open discussion. Some were accepted by the Committee as being judgmental indications. The few requiring additional study were communicated to the surgeon with a request for further documentation or justification. A rare case was not acceptable to the Committee and the reasons were formally transmitted to the surgeon with an admonition to use better judgment in the future.

This approach has achieved great success. Over the years, formal committee communications to individual surgeons decreased. These communications served a worthy purpose; i.e., one-to-one education of the surgeon from his own practice experience. Although educational, surgeons do not enjoy receiving letters from peer review committees intimating that their surgical care is being questioned. They learn, and they learn fast and well. In recent years, the rare communications are addressed to the newly arrived surgeon, "the new guy on the block", whose education in transfusion practices on his residency was lacking. The "new guy" also learns quickly.

Personal Education

In addition to formal scheduled CME conferences and medical staff committee transfusion review, a major part of our improved transfusion practices derived from repeated casual discussions with physicians about individual transfusion experiences. Most of these conversations represented unsolicited advice; surgeons were not in the habit of asking our opinion about the indication for giving a blood transfusion. Far more often, the patient had already been transfused, and when we looked for adequate indications and found them lacking, we instituted the discussion. I would not suggest that this is easy nor that all pathologists should involve themselves in similar confrontational education. It requires elements of crusading and intervention far from universal in physicians.

Part of our input for finding cases worthy of discussion with individual physicians derived from our responsibility in blood bank administration. The blood bank technologist would make us aware of a patient

receiving a series of transfusions for chronic anemia, in whom transfusion reactions were becoming frequent. A quick perusal of the chart would indicate that the attending physician was transfusing to maintain an arbitrary hemoglobin concentration without considering whether the low hemoglobin was really a problem to the patient. Our conversation would begin with a discussion of how multiple transfusions contribute to the problem of increasingly severe reactions and that a good way to lessen the problem is to aim at a lower hemoglobin concentration. If the conversation was particularly well received, an attempt was made to have the clinician ignore hemoglobin values entirely and transfuse only on the basis of recognized symptoms of anemia. These efforts often resulted in elimination of the need for transfusion as the patient arrived at his level of erythropoiesis. The patient did as well at the lower hemoglobin level.

This individual approach was equally applicable to postoperative reduced hemoglobin (notice how I avoided the term "anemia") concentrations secondary to surgical blood loss. As the surgical blood loss was replenished by plasma refill (or intraoperative electrolyte solutions) and the hemoglobin would fall, surgeons were in the habit of transfusing to some predetermined level; most commonly, patients with hemoglobins below 10-11 gm/dl received blood. Our involvement in this practice was to convince the surgeons that postoperative hemoglobin levels below 10 grams were entirely consistent with a completely satisfactory postoperative course, and that not only would the patient do equally as well as at a higher hemoglobin level, but the surgeon would avoid the risk and expense of blood transfusions. Our emphasis was to teach the pathophysiology of acute blood loss or chronic anemia, encourage the physician to "look at the patient", clinically evaluate him, and to ignore the laboratory test result. Once the surgeons had experience with this approach, and noted that patients undergoing total hip replacement with postoperative hemoglobin of 8 gm/dl did perfectly well, they were converts. Our gynecology and obstetric patients began to be discharged with hemoglobins of about 8 gm, receiving iron therapy, and with no untoward results. Soon, physicians were coming to us, proudly talking of patients discharged with hemoglobins between 7 and 8 gm/dl, and emphasizing that postoperative convalescence was not compromised in any way.

Not all of our physicians were so easily educated. Some disagreed with us, pointing out a series of arguments. Many of their theses had long been disproved. Examples of their arguments follow:

"My patients *do better* when they are nice and

pink'' is a common rejoinder. We point out that it is not how much oxygen is carried by red cells (a reflection of hemoglobin concentration) that counts as much as how much oxygen is being delivered to tissues. In the postoperative period, except in cases of known clinically severe cardiovascular diseases or cerebral arterial insufficiency, oxygen delivery in the postoperative patient is adequate down to extremely low hemoglobin levels. When asked how low the hemoglobin can go, I usually state that I do not know and that the best way to find out is to look at the patient and see how he is doing.

The old notion of a blood transfusion as a ''tonic'' has been generally discarded. However, some physicians still comment on the *nutritional value* of blood in the postoperative patient. Our response to that is that the protein in a unit of blood is approximately equivalent to two hard-boiled eggs and that blood transfusion is an awfully expensive and dangerous way to feed the patient. Some have facetiously countered with, ''Can you grind up the eggs and give them IV?''

One of the more common prevailing misconceptions about ''adequate'' postoperative hemoglobin levels is that it is necessary for *wound healing*. This erroneous concept is easy to answer because abundant articles⁸⁻¹⁰ on the effect of hemoglobin levels on wound healing have been published for at least three decades. The experimental data included work on wounds, in either acute or chronic anemias, in anemias of various etiologies — including iron-lack, hemolytic, or experimental blood loss. In all experimental situations, wound healing, as measured by tensile strength, collagen deposition, or other index of healing, is unaltered. Some reports actually indicate slightly improved wound healing at hematocrits of 30 percent over that of 40 percent. Since this latter data is not widely accepted and would be difficult for the practicing surgeon to believe, ''improved healing'' due to anemia is not emphasized.

Another argument frequently offered to support arbitrary preoperative hemoglobin levels is that *anesthesiologists*^{26,27} require adequate hemoglobin levels to minimize anesthetic risk. Accordingly, minimum preoperative levels have been demanded by anesthesiologists at many institutions before proceeding with surgery. Fortunately, such practices are beginning to be less frequent than before. Transfusing patients arbitrarily for low or borderline hemoglobin levels is certainly a greater risk to the patient than the possible blood loss. Preoperative chronic anemia of any etiology has already resulted in a shift of the oxyhemoglobin dissociation curve to the right, such that oxygen is more readily released from red cells

under hypoxic tissue oxygen levels²⁵. The shift, mediated by erythrocyte increase of 2,3-DPG, improves oxygen availability to the tissues of the anemic patient, although oxygen-carrying capacity by red cells is decreased. We are far more concerned with oxygen release to tissues than oxygen-carrying in red cells. Not only has the anemic patient's red cells automatically compensated for anemia, but the risk of correcting anemia preoperatively in a chronically anemia patient is considerable. Hypervolemia can occur with transfusion and the already favorably shifted (to the right) oxyhemoglobin dissociation curve may be reversed by transfusing red cells with depleted 2,3-DPG, the so-called ''storage defect''²⁸.

In addition to wound healing, some physicians cite *resistance to wound infection* as a reason for ''normal'' hemoglobin values. Reasons for wound infections are primarily the type of surgery and the level of surgical skill. In neither animal experimentation nor human clinical observation have wound infections been correlated with reduced hemoglobin levels⁸⁻¹⁰.

Some surgeons believe that their patients ''do better'' with postoperative hemoglobin values above a stated figure. Such subjective and undocumented observations are difficult to dispute. Perhaps what the surgeon means by ''doing better'' is that the patient ''looks better''; i.e., less pallor. Perhaps, but as pointed out earlier, pallor is a problem for the observer, not the patient.

Another misconception voiced over the years is that *cachectic patients*, many with advanced cancer, have *reduced blood volume* and therefore are at extra risk in surgery. The result of this error is preoperative transfusion of cachectic patients. The classic work on human starvation by Ancel Keys²⁹, repeated recently by Moyer³⁰ and colleagues, demonstrated that cachectic patients have normal or supernormal blood volume due to increased plasma volume. Since red cell mass decreases proportional to weight loss, hemoglobin concentration and hematocrits decrease. However, these unfortunate patients have enough red cells for their needs and possibly even more plasma volume. Therefore, preoperative transfusion serves no obvious purpose, and because their blood volumes are normal or increased, transfusion presents the hazard of causing pulmonary edema.

A major concern of clinicians, both in blood loss situations and chronic anemia, is the potential for a complication of cardiovascular disease, particularly in older patients. Concern is expressed for patients with known arterial disease, as well as older patients potentially subject to arterial insufficiency who have had no prior clinical history. ''What if Mrs. A has a

stroke?" or "Mr. G might have a coronary with a hemoglobin of 8 grams", are common expressions of physician anxiety. Absolute answers to these legitimate concerns are unavailable. Indeed, any older patient, with or without a prior history of vascular disease, may sustain a myocardial or cerebral infarction — at any time and under any circumstance. During surgery on older patients, perfusion should be carefully monitored to avoid hypotension. With proper maintenance of perfusion — steady pulse, blood pressure and urine output — the risk of infarction in the older patient is no greater than when not in surgery. Low hemoglobins in older patients, if perfusion is maintained, do not contribute a measurable risk during surgery. Some have suggested that reduced hemoglobin with its lower blood viscosity might even diminish the risk of arterial occlusion. The practice of hemodilution during coronary bypass surgery is an example of the value of reduced viscosity.

The matter of risk of cerebral or myocardial infarction in the chronically anemic patient also appears no greater than if the patient was not anemic. Chronic anemia does not increase cardiac output³¹ down to hemoglobin levels of 7 grams. At rest, anemic patients above 7 gm/dl have no dyspnea; exertion is necessary to separate moderately anemic patients (above 7 grams) from normals in terms of dyspnea or cardiac output. Improved viscosity of anemic blood and increased oxygen tissue release due to elevated erythrocyte 2,3-DPG significantly protects anemic patients from cardiovascular compromise. The anemic patient may be placed at greater risk with blood transfusions³² unless extreme precautions are taken. Decreased peripheral vascular resistance may lessen the workload of the heart in the chronically anemic patient³³. Angina pectoris occurs infrequently in anemic patients because of maximal extraction of oxygen from the blood by the myocardium³⁴. In summary, risk of myocardial or cerebral infarction in the chronically anemic patient appears small because of multiple protective mechanisms. The concern of physicians in this sphere appears overstated.

Finally, clinicians cite a number of reasons for maintaining preoperative and postoperative hemoglobins above arbitrary levels, all of which I include under the category of *physician anxiety*¹¹. Although a higher hemoglobin level may theoretically be desirable, should a lower hemoglobin level instill sufficient concern into the physician's mind such that he subjects the patient to unnecessary transfusion. I hope not — for the patient's sake. Well directed educational efforts directed toward our physician colleagues are the key to decreasing needless physician concerns about transfu-

sion practices.

Evaluation

As is true of both needs assessment and educational content, the evaluation portion of our CME exercise to improve transfusion practices was unplanned. Not only did we not organize the evaluation, but the study which provided all of the objective data occurred without our knowledge. It was only after the study performed by an outside organization was completed that we learned of its existence.

For many years, we had a general impression that NMMC was doing something different with transfusion practices. Lecturing around the state provided exposure to other institution's experience with transfusions. Additional hints that we were using less blood was provided by our regional blood facility in comparative statistics of blood usage in Minneapolis hospitals. That data indicated to us that, despite a high volume of surgery, NMMC appeared to use less blood than other community hospitals. This general impression of "better" transfusion practices at NMMC remained just that — an impression — until we were made aware of a just-completed comparative study of transfusion practices in which NMMC was a participant. This study, of which we were totally unaware until its completion, accomplished what I had long dreamed of doing.

The Study

The Foundation for Health Care Evaluation (FHCE) is a designated Professional Standards Review Organization responsible for a variety of peer review activities in this area. In their surveillance of surgical practice, their Quality Indicators Task Force designed a study of transfusion practices covering calendar year 1980. The purpose of the study was to see if blood transfusions served as an index of surgical skill.

Five institutions were chosen for the study, four from the seven-county metropolitan area covering the Twin Cities, and one from northern Minnesota. North Memorial Medical Center (NMMC) was asked to participate in the study by the Task Force and elected to participate. However, the pathologists were initially unaware, with no input into the design or the conduct of the study. With the exception of NMMC (Hospital C), the identity of the other four participating hospitals is confidential to the FHCE and is unknown to me. The five institutions provided patient records of all cases of the coded operative procedures. Examination of these records was accomplished by personnel from FHCE.

The Task Force selected five common major surgical operations. Not only are these procedures commonly performed in community hospitals, but

they also are of sufficient magnitude to frequently receive blood transfusions. The selected operations were modified radical mastectomy, hemilaminectomy for herniated disc, right hemicolectomy, transurethral prostatic resection (TURP), and open reduction with internal fixation of fractured femoral heads. The study included all cases of the procedures at each hospital in 1980; only 50 percent of cases of TURP at each hospital were included to provide numerical balance. Since the study covered only federally funded patients, of which many are Medicare over age 65, relatively few hemilaminectomies were included; surgical correction of herniated intervertebral disc is more common in younger patients.

Data obtained from the patient charts included numbers of blood transfusions (whole blood or packed red cells), estimate of surgical blood loss (from the operative or anesthesia record), day of transfusion in relation to day of surgery, and hemoglobin concentrations preoperatively and at discharge. Only the above objective data, readily gleaned from the chart without additional inquiry, were included in the chart reviews. Results of surgery, complications, mortality, etc., were not included in the study.

The Task Force arbitrarily designated *variations* for each type of surgical procedure. A variation is defined as the transfusion of blood above a preselected acceptable number of units. Variations were zero units for hemilaminectomy and three units for right hemicolectomy; two each for the other three procedures. The increased number of units permitted for hemicolectomy assumes preoperative anemia secondary to chronic blood loss.

Results

Of the five selected hospitals, quantitative variability is seen (Table 1) with the five surgical operations. Total number of cases reviewed varied from a high of 198 at NMMC (Hospital C) to a low of 48 at Hospital E. Some of the hospitals appear to specialize more in one procedure than another. For example, Hospital E, with the lowest total volume of cases reviewed, had a number of TURPs approximately equal to the other hospitals. Further, Hospital D appears to specialize in hemilaminectomies. These numbers are displayed in Table 1.

A total of 522 procedures were examined from the five hospitals for surgery performed during 1980. Of the 522, 142 (27 percent) received blood transfusions and 50 patients (10 percent) received more units than allowed by the variations criteria. Variations, as defined by the Task Force, are also shown in Table 1. Hospital C (NMMC), despite a higher number of total cases than the other four hospitals, had only two variations (one percent of 198 cases). Only Hospital E approached this performance, with one variation (two percent of 48 cases).

In addition to variations, Hospital C performed well in total transfusions in relation to cases reviewed. Figure 1 indicates that NMMC transfused only seven percent of its cases; the other institutions varied from 13 percent at Hospital E to 40 percent at Hospital D.

As transfusion data for the specific surgical procedures are examined, unique differences of transfusion requirements are revealed. Figure 2 depicts the proportion of each surgical procedure requiring any transfusion; also shown is the number of variations for

Table 1

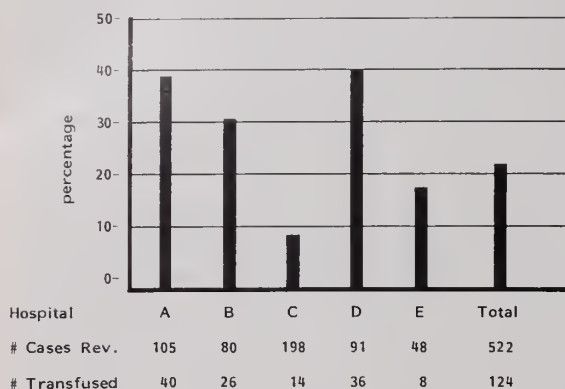
VARIATIONS IN UNITS OF WHOLE BLOOD/PACKED CELLS
BY PROCEDURE AT EACH HOSPITAL
(Excluding units of blood given pre-operatively)

Hospital	Hemilaminectomy		Rt. Hemicolectomy		TURP		Internal Fix. Femur		Mastectomy		Totals	
	Cases Reviewed	Variations	Cases Reviewed	Variations	Cases Reviewed	Variations	Cases Reviewed	Variations	Cases Reviewed	Variations	Cases Reviewed	Var.
A	3	1	14	1	31	1	41	5	16	1	105	9
B	6	2	6	0	40	2	24	4	4	0	80	8
C	4	1	20	0	48	0	90	1	36	0	198	2
D	13	3	10	0	29	0	25	8	14	0	91	11
E	--	--	2	0	29	0	12	1	5	0	48	1
TOTAL	26	7	52	1	177	3	192	19	75	1	522	31

FIGURE 1

PROPORTION OF PATIENTS GIVEN WHOLE BLOOD/PACKED CELLS
INTRA-OP OR POST-OP AT EACH HOSPITAL

(excludes blood given pre-op)



each operation. For TURP, despite a large number of cases (177 or one-third of the total), transfusions are rarely required. Similarly, modified radical mastectomy rarely required blood transfusion. Surgery on a skin appendage, particularly with modification of the operation to exclude pectoral muscles, permits the surgeon to control blood loss. Also, the total number of hemilaminectomies in this study are too few to provide meaningful comparative data. Although it appears that transfusions are given for almost half of the hemilaminectomies, and that variations are high, the number of cases at each hospital are too few to draw conclusions.

The most interesting — perhaps startling — comparisons are seen (Figure 3) in cases of open reduction and internal fixation of fractured femur. Hospital C (NMMC), despite performing 90 procedures, almost half of the cases, transfused only ten (11 percent) patients and had only one variation. As Figure 3 depicts, this compares most favorably with the other institutions, varying from transfusion rates of 38 to 75 percent. Similar but less striking comparative data exists for hemicolecotomy, where transfusion and variation rates were lowest at Hospital C.

The explanation for the low transfusion rates at Hospital C is available by examining data for surgical blood loss, the date of transfusion in relation to day of surgery, and preoperative and discharge hemoglobin levels. Surgical blood loss was not significantly different from institution to institution, indicating that the surgical skill of Hospital C surgeons is not responsible for its reduced number of blood transfusions. With particular reference to open reduction/internal fixation of hip fractures, blood transfusions

FIGURE 2

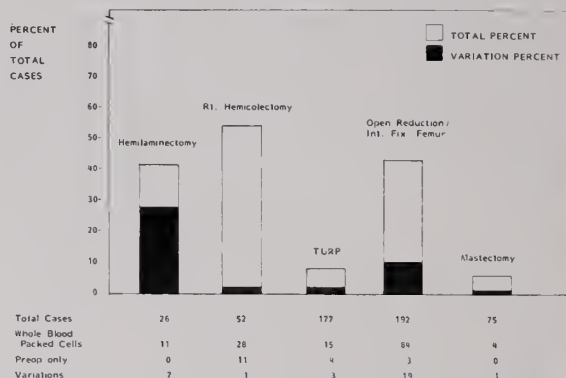
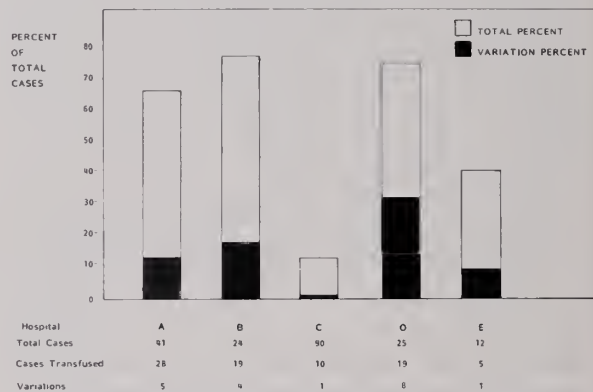
PERCENT OF CASES GIVEN WHOLE BLOOD/PACKED CELLS AND
VARIATIONS TO MAXIMUM UNITS FOR SELECTED SURGICAL PROCEDURES

FIGURE 3

OPEN REDUCTION AND INTERNAL FIXATION OF FRACTURED FEMUR
PERCENT OF CASES GIVEN WHOLE BLOOD/PACKED CELLS (EXCLUDING PREOP)
AND VARIATIONS TO MAXIMUM UNITS

were equally divided between the day of surgery (mostly intraoperative), the first post-op day and two or more post-op days. Intraoperative blood replacement is usually related to measured blood loss or to questions of adequacy of perfusion. Some of this decision to transfuse is arbitrary, with transfusions administered for the measured quantity of blood lost rather than how the patient is perfusing. Transfusion on the first or subsequent postoperative days, after plasma refill has occurred, is a result of reduced hemoglobin values. The surgeon has decided that the postoperative hemoglobin level is too low. This interpretation is confirmed by comparing discharge hemoglobins at the five institutions. Hospital C (NMMC) hip fracture cases had discharge hemoglobins lower than the other four hospitals, almost 1.5 grams lower than the mean of the entire group.

Similar data is noted on hemoglobin concentrations stimulating preoperative blood transfusion for anemic right colon cancer patients. The mean hemoglobin at which blood was preoperatively transfused was lower at Hospital C than the other institutions.

Discussion

The question of the value of CME in improving medical practice is worthy of examination. Those of us active in CME activity naturally assume that our efforts to educate our fellow physicians are worthy. Because the quality of medical practice is such a subjective concept, with innumerable variables, we have narrowed our educational endeavor to an objectively quantifiable subject — transfusion practices.

Even in this seemingly small area of medical decision-making, the results of our study are subject to challenge. Some cynics may say, "So what. What's the big deal. So you give a fewer number of transfusions." Indeed, are fewer transfusions inherently worthy, or are we subjecting our patients to unnecessary risk to prove a controversial thesis? As long as the patients do well, with equivalent morbidity and mortality, with equal hospital length of hospital stay and time of convalescence, we believe that reduced use of blood transfusions is, *a priori*, an index of improved practice. Risk of transfusion, expense and a host of unknowns are reduced. Blood is a biological product, and we continue to learn that we are transfusing substances other than desired erythrocytes or colloid volume. We accept the basic premise that, if the patient does as well with or without a mode of therapy, then it is advantageous to withhold the therapy. Hopefully, this philosophy of therapeutic parsimony will become more generally accepted.

Another objection to our conclusions from this study is that patient outcomes at Hospital C are not truly equal to the other institutions because they were not specifically examined in this transfusion mini-study. Such data is indeed lacking. However, historically, Hospital C has demonstrated length of stay and cost of each stay as equal to or better than most similar institutions in this metropolitan area. Further, clean wound and overall infection rates are low, clearly below published national averages. Our peer review of surgical practices has not uncovered any systematic problem related to transfusion or any aspect of surgical skill. Although results of surgery were not specifically studied, our experience with surgical care has not heretofore revealed a problem.

Another potential argument against the conclusions of this study is that surgical skill at NMMC is superior to the other institutions. Although very difficult to quantitate, the objection remains theoretical because nothing to support it is available. The only measurable aspect of surgical skill — blood loss — is comparable in the five hospitals.

An admitted deficiency in this comparative study of five hospitals is including only five surgical proce-

dures; elective transfusion for chronic anemia was not studied. The reasons for including only five common operative procedures is to minimize patient variables. If we were to compare transfusion practices in medical patients with chronic anemias, an infinite number of nonquantifiable parameters would be introduced, and the comparison would be meaningless. In these five common operations, great similarity exists in the clinical problem — easily classified, usually uncomplicated by other conditions, and with a single mode of therapy. The only variable is blood loss and the physician's decision to correct it with blood transfusion. We believe that valid conclusions can be derived from such a study.

A further reasonable objection can be made to our conclusion that CME is responsible for the superior transfusion practices at Hospital C. Has this result occurred purely by chance or are there institutional or surgical variables as yet not identified? To the question of unknown variables, although one should exercise caution in drawing conclusions, we find it easier to consider things we know rather than concepts better described as purely conjectural. Again, is it accurate for us to take credit for CME as the cause of better transfusion practices? Because it is our impression that our CME emphasis on transfusion practices is both intense and relatively unique, we believe that CME is etiologically involved in the desirable result.

The most convincing aspect of our conclusion about the value of CME in improving transfusion practices is our complete lack of involvement in the evaluation process. Not only were we completely uninvolved in the mini-study, but we were unaware of the study until after it was completed. The significance of the results was not immediately apparent to the FHCE because they hoped that transfusion practices would serve as an objective index of the quality of surgical care, rather than a measure of the quality of transfusion practices.

A final question to be addressed is the validity of a five-hospital study. Is it valid to extrapolate from five hospitals to the entire state or even a wider area? Since we were not involved in the FHCE study design, we cannot address their choice of institutions. However, since inherent in their study is a desire to randomly sample hospitals and not introduce bias, it becomes incumbent on one who suggests bias to either provide data or explain why the FHCE would be prejudiced. Our conclusion is that the mini-study introduced no bias and can be extrapolated to experience throughout the state.

Some discussion is warranted on our explanation of why transfusions are administered less often at Hospital C, either overall for the five surgical

procedures, and also more specifically for open reduction/internal fixation of hip fractures and right hemicolectomy for cancer. Available data of estimated blood loss for the operations at the five hospitals provide no explanation for the differences in blood transfusions administered. The differences relate to the surgeon's decision to transfuse. For Hospital C, not only did the surgeons replace less blood intraoperatively, but perhaps more important, believed that patients on the first or subsequent postoperative days did not require blood transfusion for any arbitrary reason, that usually being reduced hemoglobin levels.

Summary

We have attempted to show that continuing medical education (CME) can alter physician practice in the narrow area of transfusion practices. This report describes a CME endeavor in educational terms — needs assessment, educational content and evaluation. In this instance, needs assessment predominantly involved the education of the teachers — pathologists in this case — that the teaching of transfusion practices is a worthwhile project and amenable to improvement. The educational content included formal conferences, medical staff peer review committee activity, and individualized instruction of physicians on a one-to-one basis. Both needs assessment and education occurred without specific planning over a period of many years. Evaluation was accomplished for us, accidentally, by an outside independent agency examining a premise entirely apart from improved transfusion practices. We believe we have demonstrated that CME can alter medical practice, in this instance improved transfusion therapy.

The improved transfusion practices resulting from

our CME efforts derive from the following precepts:

1. Major physiological compensatory mechanisms occur to protect the patient with major surgical blood loss from inadequate tissue perfusion. Balanced electrolyte solutions are capable of supplementing the body's compensations in blood loss situations approaching 50 percent of blood volume.
2. Surgical patients tolerate postoperative anemia very well with no compromise to wound healing, resistance to infection, length of stay or convalescence.
3. Chronic anemia is remarkably well tolerated by the patient, both in terms of risk and symptoms of anemia.
4. Symptoms are more prominent in the attending physician than in the anemic patient.
5. Physicians responsible for transfusion decisions should understand the remarkable compensatory mechanisms of the blood loss or chronically anemic patient and greatly limit blood transfusions.
6. Look at the patient first; ignore the hemoglobin report. The clinical appearance of the patient is a far more reliable indicator than the hemoglobin concentration for a blood transfusion.
7. There are no absolute hemoglobin levels nor quantity of surgical blood loss to necessitate blood transfusions.

Acknowledgment

This publication would not have been possible without the invaluable contribution of the transfusion mini-study performed by the Foundation for Health Care Evaluation. Their study served as the critical evaluation portion of this paper. In particular, appreciation is expressed to the Quality Indicators Task Force, Ms. Virginia McCollister and Doctor William Woyda.

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18-34 See page 160.

The Rural Physician Associate Program (RPAP)

A Righton Program for All Participants

JOHN E. VERBY, M.D.*, and BERNADINE FELDMAN, Ph.D.†

On-site, free Continuing Medical Education for rural Minnesota primary care physicians and other helping professionals is provided by the Rural Physician Associate Program. This unique outreach eliminates the time away from the office usually necessary to obtain this. Professional and personal isolation disappears as consultative and referral relationships with the University are established.

THE RURAL PHYSICIAN Associate Program (RPAP) was born out of the direct concerns of citizens and legislators in Minnesota regarding a decrease in primary care physicians in rural areas of the state. The RPAP, developed in 1971, is one of the badly needed "flowers" editor Richard Reece, M.D. asked about in a recent issue of MINNESOTA MEDICINE. This undergraduate medical school effort is now in its twelfth year. Thus far, approximately 350 junior year medical students (eight academic quarters) have been involved in rural communities for nine to 12 months with primary care physicians serving as their on-site preceptor-tutors. Each RPAP student receives two academic quarters' credit for the year's experience.

A crucial part of the RPAP has been the relationship between the medical school student and the preceptor. This includes a commitment both in time and personal funds by the physician/preceptor and/or his associated colleagues. This commitment is reflected in the \$5,000 per student stipend provided by the local physician(s). An additional \$5,000 is provided to the student by the taxpayers through a state legislative special appropriation. Three million dollars have been provided over the past nine years, equally contributed by the physician/communities and the taxpayers. No written or legal commitment is requested by either group from the students, yet, over 60% of the students are returning to rural communities to practice (Verby, 1980).

This community medical education effort surpasses any made by an educational institution anywhere. Its impact on the medical school undergraduate student body has been very evident. Each year since RPAP's inception, approximately 35% of each senior class of 240 or more now choose family practice as

their medical specialty. In addition, the actual, direct cost to the medical school per year per student is significantly *less* for RPAP students than for those in the medical school. Also notable is that National Boards I and II scores showed no statistically significant difference between RPAP students and those back at the medical school. In 1979, RPAP students as a group were 19 points ahead of their classmates in the Public Health section.

Continuing Education Component

The continual daily contact between the medical student on RPAP and the rural physician prevents isolation for both. A further benefit for students and preceptors is the provision of rapid medical school library searches to obtain current articles on clinical problems. This useful resource contributes to their up to date knowledge base which is so necessary to facilitate immediate, accurate diagnosis and treatment. Equally important is the long-term, "habit" effect of this process. It is a method of stimulating continual self-learning for the preceptor and student. Another educational resource involved in the program are specialty faculty visits, of which there have been 1,500 to RPAP sites over the past five years. More than 50% of the 160 rural hospitals in Minnesota have been involved in the program in the past ten years (Figure).

These educational visits have enlarged the professional horizons in a manner which cannot be duplicated by local talent. Family physicians, internists, obstetricians, surgeons, psychiatrists, neurologists, pediatricians, orthopods, physiatrists (PM&R), family therapists, experts in interviewing and interpersonal relations plus numerous other University medical school faculty continue to support these students, physicians, and helping professionals in their caring for the people of rural Minnesota. One physician said it very nicely. "For me personally, the presence of an RPAP student is a major contribution to my educa-

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TABLE 1
Frequency and Percent of Participants'
Descriptions of Beneficial Program Outcomes

Beneficial Outcomes	Number		Percent	
	Physicians/Health	Allied	Physician/Health	Allied
1. Updated an area of knowledge.	79	5	89.8	100
2. Provided an opportunity to meet U of M medical faculty.	64	5	72.7	100
3. Learned new skills or new information.	60	5	68.2	100
4. Provided validation concerning the general quality of medical practice within the community.	61	2	69.3	40
5. Provided an opportunity to confirm or revise my medical practice related to the presented topics.	60	1	68.2	20
6. Helped to meet my continuing education requirements.	56	2	63.6	40
7. Provided an opportunity to "check out" a resource person for future consultation or referral.*	42		47.7	
8. Contributed to revisions of medical practice within the local community.	35		39.8	
9. Stimulated subsequent discussions of program content among local colleagues.	25	3	28.4	60
10. Provided an opportunity to contact local colleagues.	8		9.1	
11. Other: Provides focus of medical education.	1			
Total N: 93				

*One physician commented, "Not when residents in training are sent out."

TABLE 2
Participant Identification of Major Benefits
Resulting from Specialty Faculty Visits

	Number of Respondents	
	Physicians/Allied	Health
Provision of new knowledge, updated present knowledge and skills, and contribute to CME requirements.	53	3
Increased communications, consultations, and referrals with specific U. of M. medical staff and departments.	17	1
Validated present areas of practice and stimulated review and change in medical practice.	7	
Beneficial for student learning.	6	
Increase understanding of U. of M. faculty's knowledge concerning small, community practice.	2	
Total N: 93		

tion." Another was so enthusiastic about the continuing medical education aspects of the program, that he published his feelings in MINNESOTA MEDICINE (Heid, 1979). Here he said that where RPAP existed, professional and personal isolation seemed greatly decreased! Hostility and discontent with medical school contacts dramatically declined.

By bringing the University faculty into the rural areas for continuing medical education, the RPAP eliminates the physician's need to travel to obtain this education, thus eliminating related costs including registration fees. It does away with decreased productivity in their practices which we estimate is worth \$5,000 to \$6,000 per week and allows them to immediately apply the new knowledge in their professions. The icing on the cake is that the time and

money saved allows them to honor their personal commitments in balance with their professional and academic commitments thereby having more time for their work, their families and themselves.

Outcomes

As part of the RPAP review, an evaluation of the U of M faculty visits was done to assess major program benefits. The evaluation consisted of a questionnaire (Appendix A) with on-site observation by the faculty evaluator. Table 1 lists the benefits identified by the physicians during the RPA program (item 6 of questionnaire).

Table 2 includes a summary of the major benefits stated by the physicians in item 9 of the questionnaire.

Table 3 contains local physicians' reactions to the U of M specialty faculty visits.

TABLE 3
Physicians' Identification of Impacts of
Specialty Faculty Visits

Program Impacts	Agree	Disagree	No Response
1. The specialty faculty visits have increased your willingness to consult with U of M medical faculty or staff. Comments: -already use U of M a fair amount -occasionally	64	14	10
2. Consultation with a visiting faculty member or his department has resulted from the visit.	34	50	4
3. Consultation has occurred with any U of M medical faculty or staff. Comments: -I usually refer to specialists in my group and they in turn do the referral to the U. -At times	77	8	3
4. When consulting with U of M faculty or referring patients to the U of M, you received the assistance you sought. Comments: -very hard to contact staff persons of U of M hospital. -Not always. I have referred to the F.P. department 2 patients in the past 3 years, have sent all the data I had and a list of problems I wanted checked out and they didn't do the major ones. The problem may have been with inter-agency referrals, but when one patient got lost entirely I quit, and only refer for one problem and to a specific physician.	72	3	13
5. You have received timely feedback regarding referred patients. Comments: -Absolutely -Generally -Ten physicians stated that the results were delayed unbelievably long. Two added that it depended upon the department. -Prior to 3 years ago I did refer to the U from the State Hospital. Never got letters back or information on patients unless I called and complained. -This is much better than in past but could still be improved.	55	21	12
6. Your opinion concerning continuation of specialty faculty visits. Comments: -Definitely. -They're nice, but seem awfully expensive.	83	1	4
Total N: 88			

Conclusion

The following are some of the benefits of the RPAP:

1. The University saves on tuition expenses.
2. The faculty obtains referral and real world contacts plus reduction in student teaching-learning responsibilities.
3. The preceptor gets practice help from the student with the possibility of an associate in the future, intellectual stimulation, visiting faculty, post-graduate education credit with no "downtime" for the office, library services, etc. (over 500

rural physicians from many specialties involved each year).

4. The student receives practical patient oriented education, financial support, rural experience.
5. The community obtains rural physicians.
6. RPAP has an alternative, valid, and voluntary undergraduate medical educational experience that is not possible in a tertiary metropolitan medical environment.
7. The physician input creates an intellectually stimulating environment. This in turn continually upgrades the medical care to the people in the community.

The legislative special for the Rural Physician Associate Program (RPAP) is one of the most effective ways the medical profession has found to voluntarily redistribute appropriately prepared physicians into

APPENDIX A

7

PRACTICING PHYSICIAN QUESTIONNAIRE ON CONTINUING MEDICAL EDUCATION PROGRAMS DURING UNIVERSITY OF MINNESOTA SPECIALTY FACULTY VISITS

INTRODUCTION: The following questionnaire is intended to gain participating physicians' assessments of the continuing medical education component of the Rural Physician Associate Program, Specialty Faculty Visits. The information you provide will be used by the U of M medical faculty and the Area Health Education Center project to identify areas in need of revision and to assess the effectiveness of the program.

1. Name of community you practice within. _____

2. Type of practice (check both columns)

<input type="checkbox"/> Solo practice	<input type="checkbox"/> Family medicine
<input type="checkbox"/> Group practice	<input type="checkbox"/> Ob/Gyn
	<input type="checkbox"/> Pediatrics
	<input type="checkbox"/> Internal medicine
	<input type="checkbox"/> General surgeon
	<input type="checkbox"/> Other

3. How many programs did you attend this year? _____

11. PROGRAM ASSESSMENT: Consider the programs you attended this year and rate the following dimensions on a scale of 1 to 4. Let: 1=poor, 2=fair, 3=adequate, 4=good

4. Faculty Presentors	Topics
<input type="checkbox"/> general preparation	<input type="checkbox"/> general relevance
<input type="checkbox"/> knowledge of topic	<input type="checkbox"/> application to local practice
<input type="checkbox"/> response to questions	<input type="checkbox"/> level of interest
<input type="checkbox"/> attitude toward local M.D.s	
<input type="checkbox"/> ability to communicate information	

Do you have any additional comments about the program? _____

111. PROGRAM IMPACTS

6. Which of the following statements describe beneficial program outcomes you have experienced? (Check those that apply)

- ☐ helped to meet my continuing education requirements.
- ☐ learned new skills or new information.
- ☐ updated an area of knowledge.
- ☐ provided an opportunity to contact local colleagues.
- ☐ stimulated subsequent discussions of program content among local colleagues.
- ☐ provided an opportunity to meet U of M medical faculty.
- ☐ provided an opportunity to "check out" a resource person for future consultation or referral.
- ☐ provided an opportunity to confirm or revise my medical practice related to the presented topics.
- ☐ contributed to revisions of medical practice within the local community.
- ☐ provided validation concerning the general quality of medical practice within the community.
- ☐ other (please describe any other benefits you have experienced)

7. Which of the following statements describe negative program outcomes you have experienced? (check those that apply)

- ☐ U of M medical faculty selected irrelevant topics.
- ☐ faculty presentations were poorly prepared and presented.
- ☐ faculty presentors generally gave the impression they were there primarily to recruit patients.
- ☐ faculty presentors were generally negative and condescending toward local physicians and demonstrated little interest in local physicians' needs.
- ☐ the programs generally were uninteresting and a waste of time.
- ☐ other (please list any other negative outcomes you have experienced)

8. Check the appropriate answer:

YES	NO
<input type="checkbox"/>	<input type="checkbox"/>
Have your contacts with the U of M faculty increased your willingness to consult U of M medical faculty or staff?	
<input type="checkbox"/>	<input type="checkbox"/>
Have you consulted with a visiting faculty member or their department subsequent to their visit?	
<input type="checkbox"/>	<input type="checkbox"/>
Have you consulted with any U of M medical faculty or staff?	
<input type="checkbox"/>	<input type="checkbox"/>
When you have consulted with U of M faculty or referred patients to the University, have you received the assistance you sought? (If no, please describe problem.)	
<input type="checkbox"/>	<input type="checkbox"/>
Do you receive timely feedback regarding referred patients? (If no, please describe problem.)	
<input type="checkbox"/>	<input type="checkbox"/>
In your opinion, should the specialty faculty visits continue?	
<input type="checkbox"/>	<input type="checkbox"/>

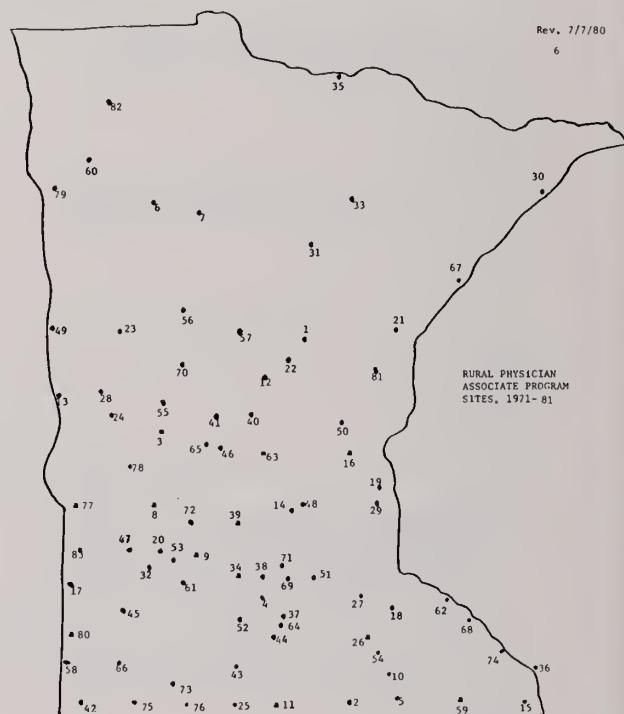
9. What would you describe as:

a) the major benefit of the specialty faculty visits?

b) the major problem of the specialty faculty visits?

10. Whether or not you have previously consulted with U of M medical staff or referred patients to the U of M medical center, what changes could be made within the U of M medical center that would increase your willingness to seek consultations and to refer patients?

FIGURE 1



Site Number, Name of Community, and Years on the Program

- | | | | |
|-----------------------|-----------------------|------------------------|---------------------------|
| 1. Aitkin (6) | 22. Crosby (3) | 43. Madelia (3) | 64. St. Peter (5) |
| 2. Albert Lea (3) | 23. Detroit Lakes (2) | 44. Mankato (7) | 65. Sauk Centre (2) |
| 3. Alexandria (5) | 24. Elbow Lake (3) | 45. Marshall (5) | 66. Slayton (4) |
| 4. Arlington (2) | 25. Fairmont (8) | 46. Melrose (5) | 67. Two Harbors (5) |
| 5. Austin (5) | 26. Faribault (1) | 47. Montevideo (10) | 68. Wabasha (4) |
| 6. Bagley (2) | 27. Farmington (1) | 48. Monticello (1) | 69. Waconia (6) |
| 7. Bemidji (3) | 28. Fergus Falls (9) | 49. Moorhead (2) | 70. Wadena (1) |
| 8. Benson (5) | 29. Forest Lake (5) | 50. Mora (6) | 71. Watertown (4) |
| 9. Bird Island (1) | 30. Grand Marais (6) | 51. Mound (3) | 72. Willmar (10) |
| 10. Blooming Pr'e (2) | 31. Grand Rapids (7) | 52. New Ulm (7) | 73. Windom (4) |
| 11. Blue Earth (9) | 32. Granite Falls (7) | 53. Olivia (1) | 74. Winona (9) |
| 12. Brainerd (3) | 33. Hibbing (8) | 54. Owatonna (3) | 75. Worthington (5) |
| 13. Breckenridge (1) | 34. Hutchinson (4) | 55. Parkers Pr'e (3) | 76. Jackson (1) |
| 14. Buffalo (4) | 35. International (3) | 56. Park Rapids (8) | 77. Ortonville (2) |
| 15. Caledonia (2) | 36. LeCroise (3) | 57. Pine River (5) | 78. Starbuck (1) |
| 16. Cambridge (4) | 37. LeSueur (1) | 58. Pipestone (3) | 79. Crookston (1) |
| 17. Canby (4) | 38. Lester Pr'e (1) | 59. Preston (4) | 80. Ivanhoe (1) |
| 18. Cannon Falls (7) | 39. Litchfield (2) | 60. Red Lake Falls (2) | 81. Moose Lake (1) |
| 19. Chisago City (2) | 40. Little Falls (7) | 61. Redwood Falls (3) | 82. Thief River Falls (1) |
| 20. Clara City (3) | 41. Long Pr'e (6) | 62. Red Wing (2) | 83. Dawson (1) |
| 21. Cloquet (8) | 42. Laverne (3) | 63. St. Cloud (1) | |

RURAL PHYSICIAN ASSOCIATE PROGRAM — VERBY AND FELDMAN

needy rural areas of Minnesota.

A special commendation is in order to the practicing physicians and helping professionals of rural Minnesota for the courage, time and money they have given for the benefit of the taxpayers and medical

students. They have accepted the liability and responsibility for every act given to their patient population by the medical students.

RPAP is a catalytic, symbiotic, complimentary LIFELINE for the community.

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Continuing Medical Education University of Minnesota

Advances in Gastrointestinal Surgery, (47th Annual Surgery Course) June 15-18, 1983, Willey Hall, University of Minnesota, Minneapolis, Minnesota, Sponsored by Department of Surgery, University of Minnesota Medical School.

Fees: \$400; \$200 (Medical Residents)

Accreditation: 30 hours, Category 1 — AMA/ACCME

Inquiries: Office of CME, University of Minnesota, Hospital Box 293, 420 Delaware Street S.E., Minneapolis, MN 55455; (612) 373-8012.

Study on Migraines in Children

Drs. Karen Olness and John MacDonald are conducting a study on migraines in children. The study will last nine months per patient and may include drug therapy and relaxation and biofeedback exercises at no cost to the patient. The children must be between six to 13 years, of either sex, with a history of severe headaches over a four-month period, have an IQ greater than 70 by WISC Form R and have a normal neurological exam by a pediatrics neurologist at the beginning and end of the study. Excluded from the study will be children who have had prior experience with self hypnosis and those with a history of asthma, diabetes mellitus, or known hypoglycemia. If you know of a patient who would benefit from this research, please call Dr. MacDonald at 588-0661.

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Maintaining Defensible Medical Records

Components of a Defensible Hospital Chart

MMIE Risk Management Committee
Frank E. Johnson, M.D., Chairman

A complete, accurate, and objective hospital medical record is essential for the protection of the patient, the hospital, and all physicians, nurses, and allied health personnel involvement in a patient's treatment. Serious medical injury to the patient is avoided when the chart is current and reflects the patient's progress, or lack of it, while hospitalized. A well-prepared hospital chart also offers a solid legal foundation for defending the hospital, doctors, and nurses against allegations of negligence, improper treatment, or omissions in care. A poor medical record may encourage the patient's attorney to pursue a malpractice case which seems otherwise defensible. If a lawsuit is filed, an incomplete or inaccurate record enables the plaintiff's attorney to challenge verbal testimony and to create doubt in the minds of jurors. The less precise, the more subjective and incomplete the notes are, the better chance the plaintiff's attorney has to convince a jury to believe his client, rather than the defendants.

Contents and Style

Four essential characteristics of a good hospital medical chart are: Completeness, objectivity, consistency and accuracy. The medical chart which best protects the patient from injury, and provides a solid foundation in the defense of a malpractice claim includes the following:

Admitting History

The admitting history should objectively and completely identify the patient's complaints. Allergies and previous reactions to medication or treatment should be noted. If history is provided by someone other than the patient, identify the historian. The physician's exam findings should be clearly distinguished from information provided by the patient. Significant changes in history, or the patient's revision or revocation of consent, should be promptly noted in

the chart.

Progress Notes

Physicians' progress notes should be meaningful and objective. Many physicians have adopted the SOAP format for progress notes which prompts a complete entry. S=Subjective data: how the patient describes his complaints; O=Objective findings the physician observes or finds on exam; A=Assessment of the objective findings and the patient's subjective complaints; P=Plans for further treatment. Other charting formats are equally acceptable when they provide sufficient information to assist others who co-treat the patient, and adequately document the patient's course. A progress note which says, "No problems," does not identify what actions (exam or discussion) occurred during the physician's visit. Progress notes should be dated and timed.

Physicians' Orders

Clear, concise orders facilitate communication between physicians and nurses, prevent errors, and avoid delays in compliance. Instead of the order, "Check vital signs," the physician should indicate how often the check should be made and exactly what findings should be reported. Vague orders, such as "Call me if problems develop," may result in frequent and unnecessary calls to the physician. Orders should state specifically the types of problems which require notifying the physician; e.g., increase in temperature (how much?), reactions to medication, and changes in fluid output (how much?).

Operative Reports and Discharge Summaries

Timely dictation of operative reports and discharge summaries is essential. A report dictated long after a complication has occurred may be regarded as self-serving and not reflective of the situation at the time of surgery or discharge. Before signing any dictated report, fill in blanks left by the typist, and correct errors in transcription. All corrections should be initialed and dated.

Articles in this series are not legal advice. Readers should obtain specific legal advice from a qualified attorney.

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1. The Air Force will sponsor qualified physicians during the last year of Residency Training. In some cases, the Air Force will sponsor a physician during the last two years of Residency Training.
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Minnesota Medical Association

1983 MMA Annual Meeting

May 18-20, 1983

(Wednesday-Friday)

Radisson South Hotel, Bloomington

Highlights of the Month

Scientific Program

On **Friday** after lunch the Scientific Program will reconvene with the plenary session on **Newer Imaging Techniques**. This lecture by Glenn Forbes, M.D., Rochester, will introduce some of the new imaging modalities that have entered clinical practice including late technology computed tomography, digital angiography and nuclear magnetic resonance. Later that afternoon participants will have the opportunity to attend one of the following breakout sessions: **Radiology Workshop — An Approach to Spinal Trauma** directed by Thomas Berquist, M.D., Rochester; **Practical Evaluation of Pediatric X-Rays** directed by Shashikant Sane, M.D., Minneapolis and **Clinical Toxicology Workshop** directed by Kusum Saxena, M.D., St. Paul.

Throughout the day on Friday there will be a continuous showing of videotapes on **Chemical Abuse**. This will be open for everyone and at no fee.

Special Events

Delegates' Luncheon — Wednesday, May 18, 12:30 p.m.: An opportunity to socialize with the delegates in the pleasant atmosphere of the Garden Court. Tickets are \$6.50 each. **Prayer Breakfast** — Thursday, May 19, 7:30 a.m.: The Ramsey County Medical Society will again host an Ecumenical Prayer Breakfast. All physicians are cordially invited to attend. **Special Luncheon for Physicians with International Experience** — Thursday, May 19, 12:00 noon: Physicians and spouses interested in and/or contemplating service overseas are welcome to attend. Tickets are \$10.00 each. The Annual Meeting Planning Committee, chaired by Richard Engwall, M.D., has responded to numerous recommendations in planning the **President's Reception and Banquet** to be held on Thursday evening at the Radisson South. Each ticket (\$30.00) covers two cocktails at the reception and the dinner. On Friday at noon the **Minnesota Medical Computing Consortium** will have their organizational meeting over lunch. All physicians interested in microcomputing are encouraged to attend. Tickets are \$12.00 each. The **Minnesota Women Physicians** are sponsoring a noon luncheon on Friday for all women physicians and medical students. Sister Mary Madonna Ashton, the new Minnesota Commissioner of Health will be the guest speaker. Tickets are \$12 for members of MN Women Physicians, \$15 for non-members, \$7 for student members. **Registration forms for all of the above activities have been placed in the Annual Meeting brochure.**

Contact: Eugenia C. Kassai, Department of Education & Specialty Affairs, Minnesota Medical Association, 2221 University Avenue S.E., Suite 400, Minneapolis, MN 55414, (612) 378-1875.

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Captain, Medical Service Corps

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MMA ANNUAL MEETING
"THE PHYSICIAN AS ARTIST"
May 19-20, 1983, Radisson South Hotel
Information Sheet

FEE: \$10 per item
(\$5 for residents
and medical students)

ELIGIBLE All Physicians
EXHIBITORS:

EXHIBIT HOURS: 8:00 a.m.-5:00 p.m., Thursday, May 19
8:00 a.m.-5:00 p.m., Friday, May 20

APPLICATION April 15, 1983
DEADLINE:

DELIVERY must be made in person between the hours of 8:00 a.m. and 3:00 p.m. on Wednesday, May 18, 1983, to Veranda 1-2 at the Radisson South Hotel (second floor).

PLEASE DO NOT SHIP DIRECTLY TO THE RADISSON SOUTH HOTEL OR TO THE MINNESOTA MEDICAL ASSOCIATION OFFICE. Neither the Hotel nor the MMA office has space for storage prior to the exhibit. Only items that can be personally delivered and picked up will be accepted.

SET-UP AND DISPLAY will be handled by the Art Show Chairman with the assistance of a consultant. Framed pieces and heavy pieces to be suspended should be equipped with wire. Mounting tape will be used to mount lightweight photographs, drawings, etc. on the walls and display panels. Shelves, tables and pedestals will be used for three-dimensional objects.

EXHIBITS MUST BE PICKED UP between the hours of 5:00 p.m. and 6:00 p.m. on Friday, May 20. The MMA cannot ship exhibits back to their owners.

JUDGING, PRIZES: A panel of expert judges will make awards on Thursday, May 19. Ribbons will be placed on the winning items.

ACCEPTABLE ENTRIES: All forms of art are encouraged. Entrants should choose artistic creations as opposed to craft products.

SECURITY: Guard service for the exhibit room will be hired between 8:00 a.m. and 5:00 p.m. on Thursday, May 19 and Friday, May 20. When the room is not occupied by a guard, it will be locked.

LIABILITY: The Minnesota Medical Association, the Radisson South Hotel, Radisson Hotel Corporation, and Brede, Inc., are not responsible for injury to persons or damage to or loss of property. It is understood that neither the Hotel nor the legal entities which own, lease and/or operate the Hotel; the Minnesota Medical Association; nor Brede, Inc.; nor their members, officers, directors or employees shall be responsible or liable for injury to any person or persons or for loss of or damage to any property belonging to the exhibitor or any person or persons. The exhibitor assumes complete responsibility and liability for all loss, damage or destruction of the property of the exhibitor, his guests and all property of the Hotel used by the exhibitor or brought upon the Hotel premises in his behalf.

The exhibitor indemnifies and agrees to hold harmless the Minnesota Medical Association; the Radisson South; Brede, Inc.; and the legal entities which own, lease, and/or operate the Radisson South Hotel; and their members, officers, directors and employees against any and all liability whatsoever arising from any or all damage to property or personal injury or loss caused by the exhibitor or his agents, representatives, employees, or any other person.

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ART SHOW APPLICATION FORM

Deadline for submission: April 15, 1983

Fee: \$10 per item (\$5 for residents & medical students)

NAME _____

ADDRESS _____
(STREET)

(CITY, STATE, ZIP)

OFFICE PHONE () _____ HOME PHONE () _____

Only one entry may be made per person per category. (Multiple paintings, drawings or sculpture may be submitted if they are in different media.) Please request additional forms if necessary and complete one form for each entry.

CATEGORY: _____ Paintings _____ Sculpture _____ Other
(medium: _____) (medium: _____) (specify: _____
_____ Drawings _____ Jewelry _____
(medium: _____) _____ B/W Photography _____
_____ Ceramics _____ Color Photography _____

BRIEF DESCRIPTION (subject, materials used): _____

TITLE: _____

DIMENSIONS/SIZE: _____ ESTIMATED VALUE: _____

(A photograph should be submitted with the application form.)

I agree to the terms indicated on the Information Sheet printed on the reverse of this form.

SIGNATURE _____ DATE _____

Please attach the entry fee (payable to Minnesota Medical Association) and photograph and return to:

Department of Education and Specialty Affairs
Minnesota Medical Association
2221 University Avenue S.E., Suite 400
Minneapolis, Minnesota 55414
612/378-1875

A list of all entries will be mailed to entrants in late April.

Please tear along this line

Minnesota Medical Association

CME in Minnesota

Provided through the Medical Education Subcommittee on CME Resources

For assistance with scheduling meetings, please contact the MMA office (address and phone given below) for information on future medical meetings and CME courses at the state and national level.

Information for each entry is arranged as follows: Date: Name of program; Primary sponsor; Location; Contact person.

March, 1983

4-5 Colon & Rectal Diseases in Primary Care; U of M; Mpls.; CONTACT: CME, U of M, Box 293 Mayo Memorial Bldg., 420 Delaware St. SE, Mpls., MN 55455, 612/373-8012.

16 Rheumatology; St. Joseph's Hospital, Brainerd; CONTACT: M.A. Meusing, M.D., 303 Kingwood, Brainerd, MN 56401, 218/829-3568.

16-26 Caribbean Air/Sea Cruise; North Central Medical Conference CME included. CONTACT: Karen Tourdot, Minnesota Medical Association, 2221 Univ. Ave., Minneapolis, MN 55414, 612/378-1875.

17-19 Cardiopulmonary Medicine, 1983; St. Paul-Ramsey Medical Center; St. Paul; CONTACT: Ruth McIntyre, St. Paul-Ramsey Medical Center, 640 Jackson St., St. Paul, MN 55101, 612/221-3992.

18 Difficult Treatment Problems Facing Physicians in Family Practice; Duluth Clinic; St. Mary's Hospital; CONTACT: J. G. Brueggemann, M.D., Duluth Clinic Ltd, 400 E. 3rd St., Duluth, MN 55805, 218/722-8364.

19 4th Annual Update Occupational and Environmental Pulmonary Diseases; Midwest Center for Occupational Health & Safety; St. Paul; CONTACT: Ruth McIntyre, St. Paul-Ramsey Medical Center, 640 Jackson St., St. Paul, MN 55101, 612/221-3992.

19-20 Endourology; U of M; Mpls.; CONTACT: CME, U of M, Box 293 Mayo Memorial Bldg., 420 Delaware St. SE, Mpls., MN 55455, 612/373-8012.

23 To Save or Let Die: Ethical Dilemmas Concerning Defective Newborns; MN Inter-religious Committee for Bio-Medical Ethics; Mpls.; CONTACT: Trudy Rogness Jensen, Chair, 4420 Philbrook Lane, Mpls., MN 55424, 612/922-3537.

24-25 Ob/Gyn Update, 1983; St. Paul-Ramsey Medical Center; St. Paul; CONTACT: Ruth McIntyre, St. Paul-Ramsey Medical Center, 640 Jackson St., St. Paul, MN 55101, 612/221-3992.

30-April 6, 7 Basic Life Support Instructor Program; Methodist Hospital; Methodist Hospital; CONTACT: Mary Ann Kempcke, Methodist Hospital, 6500 Excelsior Blvd., P.O. Box 650, Mpls., MN 55440, 612/932-5167.

April, 1983

4-5 Colorectal/Primary Care; U of M Medical School; Hyatt Regency, Minneapolis; CONTACT: CME, U of M, Box 293, Mayo Memorial Bldg., 420 Delaware St. SE, Minneapolis, MN 55455, 612/373-8012.

13-15 Annual Spring Refresher; Minnesota Academy of Family Physicians; Radisson South, Bloomington; CONTACT: Chari Konerza, MN Academy of Family Physicians, 2221 Univ. Ave. SE, Suite 426, Minneapolis, MN 55414, 612/623-9559.

14-15 Pediatric Days; American Academy of Pediatrics, MN Chapter; Rochester; CONTACT: Tony Smithson, Mayo Clinic, E 9A, Rochester, MN 55905, 507/284-2511.

16 Spring Meeting; Minnesota Society of Anesthesiologists; CONTACT: David E. Byer, M.D., 200 1st St. S.W., Rochester, MN 55901

16 Management of Diabetes Mellitus — 1983; Mount Sinai Hospital; Mpls.; CONTACT: Evelyn Peterson, Mount Sinai Hospital, 2215 Park Avenue, Mpls., MN 55404.

21-23 Allergy and Immunology; U of M Medical School; Mayo Memorial Auditorium, Minneapolis; CONTACT: CME, U of M, Box 293, Mayo Memorial Bldg., 420 Delaware St. SE, Minneapolis, MN 55455, 612/373-8012.

22 11th Annual Pediatric Challenges for Primary Care Physicians; Mpls. Children's Health Center; MCHC; CONTACT: James Moore, M.D., Indian Health Board, 2495 — 18th Ave. So., Minneapolis, MN 55404, 612/721-7425.

23 Spring Meeting; Minnesota Urological Society; Minneapolis; CONTACT: Robert P. Myers, M.D., Dept. of Urology E 17A, Mayo Clinic, Rochester, MN 55905.

23 CME Meeting, Minnesota Psychiatric Society; Mpls.; CONTACT: Patricia Rowe, 1770 Colvin Ave., St. Paul, MN 55116, 612/698-1971.

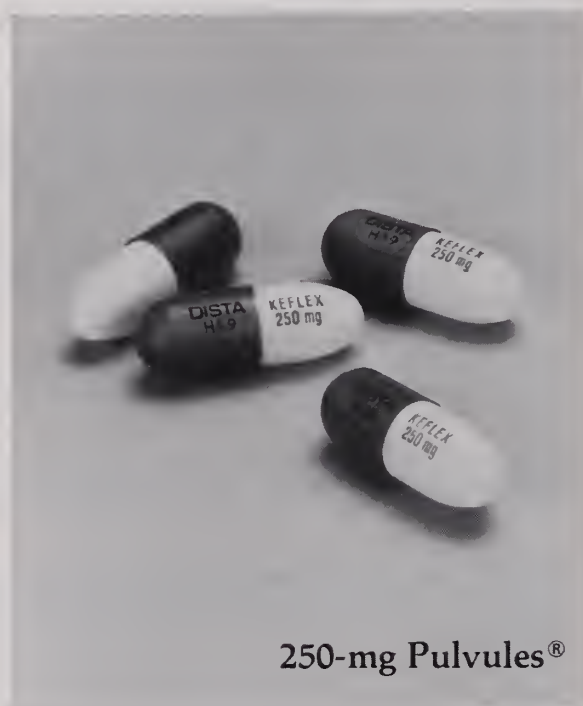
25-26 Vitreo-Retinal Disease; U of M Medical School; Holiday Inn, Minneapolis; CONTACT: CME, U of M, Box 293, Mayo Memorial Bldg., 420 Delaware St. SE, Minneapolis, MN 55455, 612/373-8012.

28-30 Current Trends in Audiology; Mayo Clinic; Rochester; CONTACT: Mayo Clinic, 200 1st St. SW, Rochester, MN 55905, 507/284-2085.

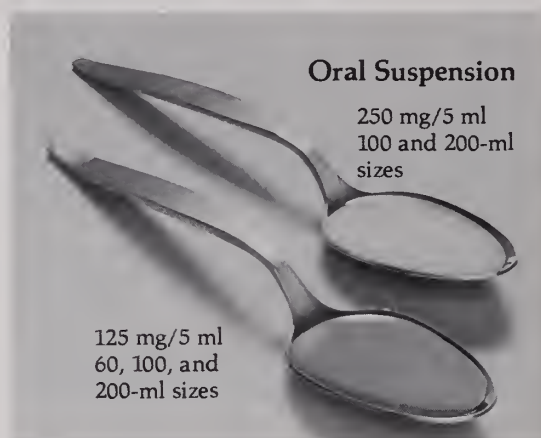
29 Semi-Annual Meeting, Minnesota Surgical Society; Duluth; CONTACT: Charles L. Barbee, M.D., 1000 E. 1st St., Suite 203, Duluth, MN 55805, 218/727-7259.

29-30 Disability Evaluation; U of M; Mpls.; CONTACT: CME, U of M, Box 293 Mayo Memorial Bldg., 420 Delaware St. S.E., Minneapolis, MN 55455, 612/373-8012.

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May, 1983

2-6 Family Practice Review and Update; U of M Medical School; Radisson Hotel, St. Paul; CONTACT: CME, U of M, Box 293, Mayo Memorial Bldg., 420 Delaware St. SE, Mpls., MN 55455, 612/373-8012.

2-6 Practice of Internal Medicine — 1983; Mayo Clinic, Rochester; CONTACT: Mayo Clinic, 200 1st St. SW, Rochester, MN 55905, 507/284-2085.

12 Medicine; St. Joseph's Hospital; St. Joseph's Hospital; CONTACT: M. A. Muesing, M.D., 303 Kingwood, Brainerd, MN 56401, 218/829-3568.

12-21 Advanced Cardiac Life Support Course; Methodist Hospital; Methodist Hospital; CONTACT: Joan Peterson, R.N., Methodist Hospital, 6500 Excelsior Blvd., P.O. Box 650, Mpls., MN 55440, 612/932-5419.

13 Quarterly Clinical Meeting; Minnesota Dermatological Society, Minneapolis; CONTACT: J. Corwin Vance, M.D., Dept. of Dermatology, HCMC, 701 Park Ave. S., Minneapolis, MN 55415.

13-14 Ophthalmic Reviews; Mayo Clinic; Rochester; CONTACT: Mayo Clinic, 200 1st St. SW, Rochester, MN 55905, 507/284-2085.

13-15 State-of-the-Art in Clinical Anesthesiology; Rochester; CONTACT: David E. Byer, M.D., 200 1st St. SW, Rochester, MN 55905, 507/286-8701.

16-17 Topics and Advances in Pediatrics; U of M Medical School; Location undetermined; CONTACT: CME, U of M, Box 293, Mayo Memorial Bldg., 420 Delaware St. SE, Minneapolis, MN 55455, 612/373-8012.

18-20 Bone and Soft Tissue Tumor Course; Mayo Clinic; Rochester; CONTACT: Mayo Clinic, 200 1st St. SW, Rochester, MN 55905, 507/284-2085.

19-20 1983 Scientific Program; Minnesota Medical Association; Minneapolis; CONTACT: Eugenia C. Kassir, Minnesota Medical Association, 2221 University Ave. SE, Suite 400, Minneapolis, MN 55414, 612/378-1875.

23-24 Basic Life Support Course; Methodist Hospital, Methodist Hospital; CONTACT: Janell Haugen, Methodist Hospital, 6500 Excelsior Blvd., P.O. Box 650, Mpls., MN 55440, 612/932-5189.

23-24 Congenital Heart Disease; U of M; Mpls.; CONTACT: CME, U of M, Box 293 Mayo Memorial Bldg., 420 Delaware St. SE, Mpls., MN 55455, 612/373-8012.

25-27 Real Time Ultrasound in Ob-Gyn; U of M; Mpls.; CONTACT: CME, U of M, Box 293 Mayo Memorial Bldg., 420 Delaware St. S.E., Minneapolis, MN 55455, 612/373-8012.

25-27 Current Concepts in Radiation Therapy; U of M; Minneapolis; CONTACT: CME, U of M, Box 293 Mayo Memorial Bldg., 420 Delaware St. S.E., Minneapolis, MN, 55455, 612/373-8012.

27 Cardiovascular Disease; U of M; Minneapolis; CONTACT: CME, U of M, Box 293 Mayo Memorial Bldg., 420 Delaware St. S.E., Minneapolis, MN 55455, 612/373-8012.

29-June 11 Dutch Waterways Adventure; North Central Medical Conference; CME included; CONTACT: Betty Schmid, North Central Medical Conference, 2221 Univ. Ave. S.E., Suite 400, Minneapolis, MN 55414, 612/378-1875.

June, 1983

3,4,5 Annual Meeting; Minnesota Thoracic Society; Location undetermined; CONTACT: Fred Rasp, M.D., 606 24th Ave. So., Suite 119, Mpls., MN 55454, 612/333-2156.

3-5 Annual Meeting; Minnesota Thoracic Society; Madden Lodge, Brainerd; CONTACT: Fred Rasp, M.D., 606 24th Ave. So., Suite 119, Minneapolis, MN 55454, 612/333-2156.

9-10 The Science of Marathon Running; Duluth School of Medicine; Duluth; CONTACT: Lynn Delvin, UMD School of Medicine, 2400 Oakland Ave., Duluth, MN 55812, 218/726-7581.

9-11 Interdisciplinary Approach to the Treatment of the Critically Ill Patient; St. Paul-Ramsey Medical Center; St. Paul Hotel; CONTACT: Ruth McIntyre, St. Paul-Ramsey Medical Center, 640 Jackson St., St. Paul, MN 55101, 612/221-3992.

10-11 Clinical Hypnosis; Earle Brown Center; St. Paul; CONTACT: CME, U of M, Box 293 Mayo Memorial Bldg., 420 Delaware St. SE, Mpls., MN 55455, 612/373-8012.

10-11 Annual Meeting; Minnesota Obstetrical & Gynecological Society; Barker's Island, Superior, Wisconsin; CONTACT: Mrs. Cammy Kelley or Dr. Carolyn B. Coulam, Mayo Clinic, 200 1st St. SW, Rochester, MN 55905.

10-11 Clinical Hypnosis; U of M Medical School; U of M, St. Paul; CONTACT: CME, U of M, Box 293, Mayo Memorial Bldg., 420 Delaware St. SE, Mpls., MN 55455 612/373-8012.

14, 21, 22 Basic Life Support Instructor Program; Methodist Hospital, Methodist Hospital; CONTACT: Mary Ann Kempcke, Methodist Hospital, 6500 Excelsior Blvd., P.O. Box 650, Mpls., MN 55440, 612/932-5167.

15-18 G.I. Surgery; U of M Medical School; Willey Hall West Bank, U of M, Mpls.; CONTACT: CME, U of M, Box 293, Mayo Memorial Bldg., 420 Delaware St. SE, Mpls., MN 55455, 612/373-8012.

23-25 Behavioral Pediatrics; U of M Medical School; U of M, St. Paul; CONTACT: CME, U of M, Box 293, Mayo Memorial Bldg., 420 Delaware St. SE, Mpls., MN 55455, 612/373-8012.

For further information on *future* CME programs, contact Department of Education & Specialty Affairs, Minnesota Medical Association, 2221 University Ave. SE, Suite 400, Minneapolis, MN 55414, 612/378-1875.

Classified Advertisements

Classified advertising rates are forty (40) cents a word; minimum monthly charge \$10.00, key number, \$2.00 additional. Replies to advertisements with key numbers should be mailed in care of Minnesota Medicine, 2221 University Ave. S.E., #400, Minneapolis 55414.

Placement of ads by telephone not accepted. We also reserve the right to decline or withdraw advertisements at our discretion. Every care is taken to avoid mistakes but responsibility cannot be accepted for clerical or printers errors.

Cancellation of ads must be made before the 10th of the preceding month's issue.

The Journal is not permitted to divulge the identity of advertisers who have replies sent to box numbers.

PEDIATRICIAN — BC/BE to join a 12 doctor multi-specialty group, southern Minnesota community of 12,000 (Trade area 70,000). Fairmont is a progressive city with excellent schools and recreational areas around a chain of five lakes. First year salary guaranteed with full partnership after one year. Contact Don Grandgenett, Administrator, Fairmont Medical Clinic, P.A., Fairmont, MN 56031. (507) 238-4263.

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WANTED: FAMILY PHYSICIAN, Board certified or eligible, to help solo physician in South Minneapolis do full time family practice. First year salary leading to full partnership. Part time work available. Write: Minnesota Medicine-727 2221 University Avenue So. E. #400, Minneapolis, MN 55414.

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DOCTORS NEEDED in Wisconsin and Minnesota, all specialties, all locations. For confidential information, mail your C.V. to Medicus, W62 N281 Washington Avenue, Cedarburg, Wisconsin 53012.

OPENINGS NOW AVAILABLE in Family Practice, OB-GYN, and Orthopedics. The Albert Lea Medical & Surgical Center, Ltd. is actively recruiting for the above positions to be filled hopefully by July-August 1983. We are an eighteen man multi specialty group with excellent benefits. Full participation after the first year. No accounts receivable buy in; incentive income plan; full and complete medical and life insurance coverage; excellent pension profit sharing program. We are recruiting family practitioners for near by satellite clinics. All moving costs assumed by the clinic. Contact G. C. Wilcox, M.D. at clinic (507) 373-1441 or at home (507) 373-6974, or the Clinic Administrator C. C. Lowery at clinic (above), or at home (507) 373-8083.

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FAMILY PHYSICIAN to join well established primary care practice. Newly remodeled clinic attached to modern hospital. First year guaranteed plus benefits. Contact Dr. Larry Rapp, Medical Arts Clinic, Elbow Lake, Mn. 218-685-4406 or Russell Sauer — 218-685-5272.

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OPPORTUNITY FOR qualified physicians at the Albert Lea Clinic, P. A., in Albert Lea, Minnesota. The clinic is a seventeen man multi-specialty group in primary and secondary care fields. The financial rewards are exceptional and practice challenges very attractive. There is a negotiated salary at top level for the first year. Senior physician participation begins at the end of the first year with a incentive income distribution plan plus expanded fringe benefits. The clinic has a low cost buy in with a maximum profit sharing plan. There is a top level insurance program, medical reimbursement program, and a full range of other benefits. A nearly new hospital in the city provides an exceptional place to work. These are choice practices in a delightful place to live. We are currently looking for physicians in general orthopedic medicine, in Otolaryngology, one OB-GYN. Please contact B. J. Boss, Administrator, Albert Lea Clinic, P. A., 1602 Fountain Street, Albert Lea, MN 56007. Phone 507-373-8251. Personal phone 507-377-1406 or contact L. E. Shelhamer, Jr., M.D., 507-373-8251 or personal phone 507-377-1530.

LA CROSSE, WI — NEONATOLOGIST needed to join 50-physician multispecialty clinic with four pediatricians/one neonatologist. Will be co-director of 14-bed, Level III, Regional Infant Intensive Care Unit in modern 350-bed hospital immediately adjacent to clinic. CT scanner and complete ultrasound available. Medical staff of 98 M.D.'s includes neurosurgeon with pediatric cardiologist, neurologist and surgeon on courtesy staff. Complete transport team with three neonatal nurse clinicians. La Crosse is a progressive, family-oriented city of 50,000 in the beautiful Mississippi River Valley with a medical referral area of greater than 200,000. Exceptional cultural, educational and recreational opportunities locally. Contact: P. S. Shultz, M.D., Medical Director, Skemp-Grandview-La Crosse Clinic, 815 S. 10th St., La Crosse, WI 54601. Phone 608/782)9760.

ST. PAUL-RAMSEY MEDICAL CENTER, Department of Psychiatry, career opportunity for a psychiatrist available in July, 1982. The position calls for clinical, educational and research efforts in the specialty. Competitive salary structure with liberal fringe benefits included. Applicants should contact Dr. V.B. Tuason, Department of Psychiatry, St. Paul-Ramsey Medical Center, 640 Jackson, St. Paul, MN. 55101.

FAMILY PHYSICIAN to join group of six Board Certified Family Practitioners and one Board Certified General Surgeon. Liberal vacation and educational allowances. Competitive salary first year with incentive bonus, and full membership after one year. Blue Earth is a farming town of 4000 in Southern Minnesota with a drawing area of 25,000. 35 bed hospital with adjoining clinic facilities. Complete ancillary support including anesthesiology, radiology and pathology. Excellent opportunity for an aggressive young family physician. Please contact: Thomas E. Watts, M.D., Blue Earth Medical Center, Ltd., 520 South Galbraith, Blue Earth, MN 56013. Phone: (507) 526-7371. Personal Phone: (507) 526-3177. Or Contact: Marjeane Werner, Clinic Administrator, Phone: (507) 526-7371. Personal Phone: (507) 854-3682.

OFFICE SPACE FOR RENT: Physician in Medical Arts Building, 825 Nicollet Mall, Minneapolis, wishes to sublet his facilities to another physician on a part-time basis for the purpose of sharing overhead expenses. Call (612) 370-0553.

SUMMER CME CRUISE/CONFERENCES ON LEGAL-MEDICAL ISSUES — Alaskan, Caribbean, Mediterranean. 10 & 14 days in July and August. Approved for 24 CME Cat. 1 credits (AMA/PRA). Distinguished professors. FLY ROUNDTRIP FREE ON CARIBBEAN AND ALASKAN CRUISES. Excellent group fares on finest ships. Registration limited. Scheduled prior to 12/31/80 — Tax deductible under 1976 Tax Reform Act. Information: International Conferences, 189 Lodge Ave., Huntington Station, N.Y. 11746. (516) 549-0869.

FAMILY PRACTICE PHYSICIANS FOR RURAL MINNESOTA — Large multi-specialty group in West Central Minnesota is opening a satellite in a productive community of 3600 (Benson) which currently has two physicians and looking to replace a retiring physician and add another for growing practice. Pleasant Growing Area, High Quality of Life, Many Outdoor Recreational Opportunities (winter and summer), Progressive, Growing Medical Group, Liberal Financial Benefits, Outstanding Pension and Profit Sharing Program. Call: P. K. Olson, M.D., Willmar Medical Center, Willmar, MN 612-231-5000.

(Continued on Page 198)

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(Continued from page 197)

ALL OF THE ADVANTAGES . . . An opportunity to practice primary care with a progressive group of physicians that values quality medicine, patient and family — centered practice, continuity of care, service to the community, and group compatibility in a location where the advantages of the Twin Cities are easily available but in a small town with the freedoms of a slower paced atmosphere.

This four-physician Family Practice is interviewing for two Family Practitioners to join the group to meet the patient needs in Glencoe and Lester Prairie, Minnesota. Glencoe is an ideal community — excellent schools, established industry and commerce, accredited hospital — and is only 53 miles from Minneapolis/St. Paul.

We welcome your interest and questions. Please contact Donald B. Rudy, M.D. or Gary Van House, Administrator, Glencoe Medical Clinic P.A. 525 East 18th Street, Glencoe, Minnesota 55336, (612) 864-3116.

INTERNIST-CARDIOLOGIST, INTERNIST-NEPHROLOGIST specialty positions available with Mankato Clinic, Ltd. Our 30 man multi-specialty group attracts specialty referrals from a southern Minnesota area of 200,000 population. Excellent group practice opportunity in All-American community with full hospital services; full range of group fringe benefits; liberal time off; salary first year; incentive pay thereafter. For more information call collect R. F. Roskens, Administrator, or Dr. B. C. McGregory, 507-625-1811.

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OFFICE SPACE FOR RENT: Physician in Loring Park area of Minneapolis wishes to rent part of his office to another Doctor. Six exam rooms, x-ray, lab, procto table, etc. Adjacent to hospital. Call 612-870-8448.

STAFF PSYCHIATRIST CMHC has an excellent opportunity for a staff psychiatrist. Must be board eligible. Programs include in-patient, out-patient, education and consultation, specialized services to children, the chronically mentally ill, and the chemically dependent delivered in conjunction with a seasoned team of multi-disciplinary mental health professionals including two part-time psychiatrists. Excellent four-season recreational area. Salary and fringe benefits negotiable. Contact: Donald E. Frees, ACSW, Area Program Director, P.O. Box 646, Bemidji, MN 56601. An Equal Opportunity Employer.

FAMILY PHYSICIAN to join three Board Certified Family Physicians in a young and growing medical practice in Central Minnesota. The practice is orientated toward Family Practice Medicine and located centrally in the state with quick access to the Minneapolis-St. Paul area. Both practices are a short distance from the St. Cloud area, and our physicians use the St. Cloud Hospital for hospitalization of their patients. Cultural and recreational activities are abundant in this area of Minnesota. The salary and fringe benefits are open and negotiable. If interested, please contact Thomas J. Newton, M.D., Medical Director, or contact Daryl G. Mathews, Administrator, at either the St. Joseph or the Cold Spring Medical Clinics, 26 North Red River Avenue, Cold Spring, Minnesota, 56320, or call collect (612) 685-8641 or (612) 363-7765 in St. Joseph, Minnesota.

NEUROLOGIST WANTED — To join a very busy, well established neurosurgeon in North Central Wisconsin. Active practice assured, extremely good income potential. New modern office located in a new hospital. Excellent community approximately 65,000 population with unlimited outdoor recreation and very good school systems. For more information contact Lloyd Engstrom. Call collect 715/842-3202 or write P.O. Box 1646, Wausau, Wisconsin 54401.

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FAMILY PRACTITIONER — Immediate need to associate with busy, Board Certified General Practitioner in Tomah, Wisconsin. Modern clinic, 57-bed local hospital, and formal association with 52-physician multispecialty clinic in La Crosse, WI. Tomah is an active, growing community of 7,000 with a medical service area of 20,000. Contact: P. S. Shultz, M.D., Medical Director, Skemp-Grandview-La Crosse Clinic, 815 S. 10th St., La Crosse, WI 54601. Phone (608) 782-9760.

CARDIOLOGY, DERMATOLOGY, GENERAL SURGERY, OPHTHALMOLOGY, ORTHOPEDIC SURGERY: Associate with 170 physicians providing comprehensive medical care to a patient population of 196,000 in one of America's leading metropolitan areas. Excellent facilities, competitive earnings and benefits. Contact: Paul Brat, M.D., Medical Director, *Group Health Plan, Inc.*, 2829 University Avenue Southeast, Minneapolis, Minnesota 55414. An equal opportunity employer.

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FAMILY PRACTICE PHYSICIAN — Wanted to join a thirteen physician multi-specialty group in Robbinsdale, Minnesota. Next to North Memorial Medical Center. Fringe benefits are excellent and salary is very competitive. A second satellite office is located in Maple Grove. Clinic is a provider for three H.M.O's. Please contact Clinic Manager at North Clinic P.A. 3210 Lowry Ave. No., Minneapolis, MN 55422 1-(612)-588-4625.

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INTERNIST AND FAMILY PHYSICIAN wanted. Physicians Clinic, located midway between downtown St. Paul and Minneapolis. Send curriculum vitae to: David H. Klevan, M.D. at 612-645-0711, Physicians Clinic, 451 N. Dunlap, Saint Paul, Minnesota 55104.

THE BOYNTON (STUDENT) HEALTH SERVICE, University of Minnesota, serving a population of 40,000 students, faculty and staff on the Twin Cities campus, has openings for two physicians. This comprehensive health care facility has a staff of 35 full and part-time physicians, 5 nurse practitioners and 15 registered nurses. One physician position requires 5 years experience practicing medicine, licensure to practice in Minnesota, and board certification or eligibility. Training and experience in preventive medicine and/or public health are desired. Administrative skills are also necessary as this position potentially will entail supervision of staff physicians, nurse practitioners and residents; communication with department heads and other Health Sciences units; administrative decision-making on matters of service delivery; and direct public contact. Requirements for the other position include 2 years of medical practice experience, licensure to practice medicine in Minnesota, training or experience in primary care and minor surgery, and interest or experience in allergy or sports medicine. An ability to work with other primary care providers, empathy for students and an intent to make a career of Health Service medicine, are also expected. Board certification or eligibility in a primary care specialty desired. Salary competitive and commensurate with training and experience. Regular hours and excellent fringe benefits including paid malpractice insurance. Positions open July 1 or September 16, 1983. Please send curriculum vitae by April 15, 1983 to Donald Severson, M.D., University of Minnesota, Boynton Health Service, 410 Church Street, S.E., Minneapolis, Minnesota, 55455. The University of Minnesota is an equal opportunity employer.

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(Continued on page 200)

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FULL-TIME GENERAL PSYCHIATRIST. Duties include: triage, outpt, day treatment, inpt, consultative and forensic psychiatric services in an experienced rural community mental health center (since 1959) affiliated with gen med and surg hosp having an outstanding 10-bed acute short-term psychiatric service. Work is 80% direct service and 20% consultation, supervision and education. Applicants must have completed approved residency and need Minnesota Med. Lic. Starting salary \$60,675 and up, depending on qualifications. Year-around local university-related CME program supplemented annually by 10 days paid educational leave with opportunities for active participation in state and national psychiatric groups. Equal opportunity employer provides professional liability insurance, 70% of premium for family health insurance coverage; excellent retirement program and generous vacation benefits. Economically sound, progressive family community in forest and lake country. Write or call Frank Kiesler, M.D., Medical Director, 215 Second Avenue SE, Grand Rapids, Minnesota 55744; 218-326-1274.

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FAMILY PHYSICIAN, board eligible, to join group of six Board Certified Family Practitioners and one Board Certified General Surgeon in Blue Earth, Minnesota. \$45,000.00 plus incentive bonus first year with full membership after first year. 4,000 population with practice area of 25,000 in South Central Minnesota. Economy is stable agricultural plus small clean industries. Connected hospital and clinic enlargements now under construction. Complete ancillary support including anesthesiology, radiology, pathology, etc. Contact Marjeane Werner, Clinic Administrator or Dr. Thomas E. Watts, Business Phone: (507) 526-7371. Blue Earth Medical Center, Ltd., 520 South Galbraith, Blue Earth, MN 56013.

WANTED: G.P. for family practice. West Central N. Dak. Twenty five bed Hospital on Interstate 94 only 75 miles from Medical center with Air Ambulance available. Two other physicians in area. Contact 701-974-3304 or write Box H, Richardton, N.Dak. 58652.

LICENSED PHYSICIAN seeks employment in metro area. Will take full or part time and family practice. Write: Minnesota Medicine (732), 2221 University S.E., Suite 400, Minneapolis, MN 55414.

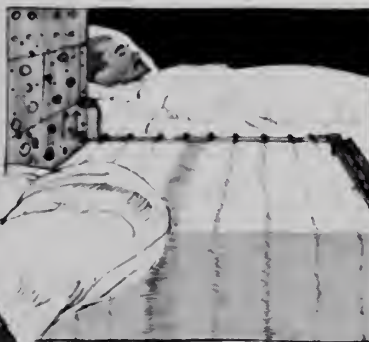
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References: 1. Kales A et al: *J Clin Pharmacol* 17:207-213, Apr 1977 and data on file, Hoffmann-La Roche Inc., Nutley, NJ. 2. Kales A: Data on file, Hoffmann-La Roche Inc., Nutley, NJ. 3. Zimmerman AM: *Curr Ther Res* 13:18-22, Jan 1971. 4. Kales A et al: *JAMA* 241:1692-1695, Apr 20, 1979. 5. Kales A, Scharf MB, Kales JD: *Science* 201:1039-1041, Sep 15, 1978. 6. Kales A et al: *Clin Pharmacol Ther* 19:576-583, May 1976. 7. Kales A, Kales JD: *Pharmacol Physicians* 4:1-6, Sep 1970. 8. Frost JD Jr, DeLucchi MR: *J Am Geriatr Soc* 27:541-546, Dec 1979. 9. Dement WC et al: *Behav Med* 5:25-31, Oct 1978. 10. Vogel GW: Data on file, Hoffmann-La Roche Inc., Nutley, NJ. 11. Karacan I, Williams RL, Smith JR: The

sleep laboratory in the investigation of sleep and sleep disturbances. Scientific exhibit at the 124th annual meeting of the American Psychiatric Association, Washington, DC, May 3-7, 1971. 12. Pollak CP, McGregor PA, Weitzman ED: The effects of flurazepam on daytime sleep after acute sleep-wake cycle reversal. Presented at the 15th annual meeting of the Association for Psychophysiological Study of Sleep, Edinburgh, Scotland, June 30-July 4, 1975. 13. Data on file, Hoffmann-La Roche Inc., Nutley, NJ.

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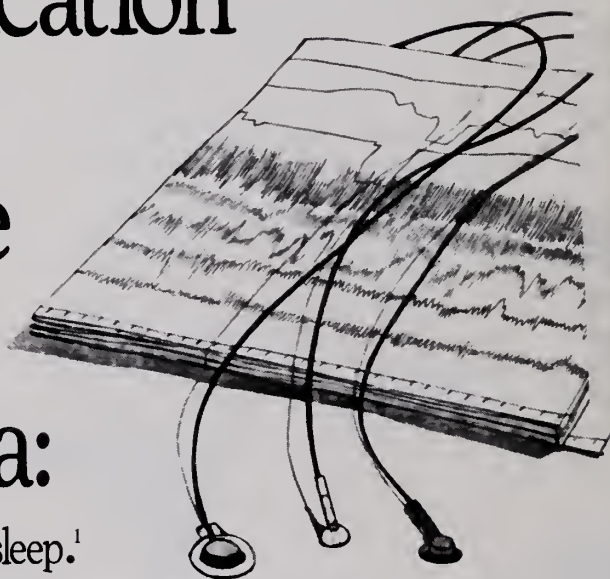
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President's Letter



Medicare and Prospective Payments

PL 97-248, otherwise known as the Tax Equity and Fiscal Responsibility Act of 1982 (TEFRA), was signed into law on September 3, 1982, by President Reagan. It will change our tax laws, but the effects on future hospital care will prove even more profound. PL 97-248 will produce the most far-reaching changes since Medicare's inception in 1966. The law will strongly modify the manner in which hospitals are reimbursed for Medicare in-patient services. Currently hospitals are reimbursed retrospectively for allowable costs, after the service is rendered. Unfortunately, Medicare's costs for the elderly and disabled have risen from \$4.6 billion in 1967 to over \$50 billion in 1982. The new law, in an attempt to contain these costs, will limit the reimbursement payment before the care is given. Under the retrospective pay system, the government was at financial risk. Now, under the prospective system, the hospital and indirectly physicians, are at risk. The 1982 law is more inclusive, covering all aspects of providing in-patient care including ancillary service and special care operating costs. Ancillary service and special care unit charges were previously billed at retrospective allowable rates.

There are some important terms that should be presented in explaining PL 97-248. First, Target Rate of Increase. This allows that maximum operating costs per discharge will be set for hospitals based on the operating cost plus an annual "target rate of increase." Herein, lies incentives, both positive and negative, for a hospital to control costs. Exceed the target rate, and only 25% of the excess costs are reimbursed. Stay below target rate and keep 50% of the savings. Secondly, Case-Mix Index will be the most important factor in determining payment per case. The Case-Mix Index measures the acuity (intensity, complexity) of

care rendered to Medicare patients in that hospital compared with hospital Medicare treatment nationally. So a hospital treating more complex Medicare cases can anticipate higher reimbursement. Thirdly, Diagnosis Related Groups (DRG) should be mentioned. This system was developed at Yale with major diagnostic categories submitted into DRGs expected to be similar and distinct in length of stay. Medicare began with 467 Yale DRGs which it then whittled down to 356 DRGs because many were inapplicable to Medicare patients. Medicare then used these remaining DRGs to construct its Case-Mix Index. It is important to remember that payment is based on The Target Rate per discharged patient rather than length of stay.

The position of your AMA is presently cautious. In principle, the AMA believes that payment to institutions on the basis of prospectively determined rates and other payment systems that create incentives for cost consciousness should be explored. Such systems should only be implemented if they prove to be cost effective. Our major experience, to date, is the New Jersey Experience, which is in its third year. At the recent AMA Leadership Conference, held in February, 1983, pros and cons were heard in regard to the New Jersey Experiment. It would appear that the Department of Health and Human Services is centering its alternative methods of payment on the DRG concept despite the fact that it is, as yet, not proven effective in New Jersey.

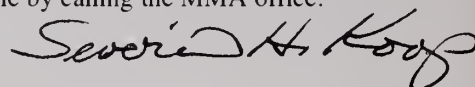
PL 97-248 is now law, and again it offers physicians and hospitals an opportunity to work together for the good of our patients. Physicians can help by coding the correct diagnoses, eliminating unnecessary studies, performing preadmission lab and x-ray studies, and educating themselves on this complex change in the

PRESIDENT'S LETTER

Medicare law.

As my tenure draws to a close, you probably look forward to an anecdotal, humorous, or philosophical President's Letter. This matter struck me of such importance that I had to forsake that type of letter. My hope is that some light has been cast to stimulate further study. You should be aware that your MMA has participated in a half-hour video tape on the

subject. I would encourage all physicians, through their clinics or hospital staff, to view this film which is available by calling the MMA office.



Severin H. Koop, M.D.
President
Minnesota Medical Association

Continuing Medical Education University of Minnesota

Advances in Gastrointestinal Surgery, (47th Annual Surgery Course) June 15-18, 1983, Willey Hall, University of Minnesota, Minneapolis, Minnesota, Sponsored by Department of Surgery, University of Minnesota Medical School.

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Inquiries: Office of CME, University of Minnesota, Hospital Box 293, 420 Delaware Street S.E., Minneapolis, MN 55455; (612) 373-8012.

Annual Ophthalmology Specialty Course, "Current Management of Vitreo-Retinal Disease" April 25-26, 1983, Holiday Inn Downtown, Minneapolis, Minnesota

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Treatment of Family Sexual Abuse: Advanced Training Project April 8-22, 1983

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Location: Research East Building, 2630 University Avenue Southeast, Minneapolis

For further information contact Diane Campbell, Program in Human Sexuality, Medical School, University of Minnesota, 2630 University Avenue SE, Minneapolis, MN 55414; or phone 612-376-7520.

Minnesota Psychiatric Society

Daylong meeting of the Minnesota Psychiatric Society will be held on Saturday, April 23, 1983 at St. Marys Hospital, Minneapolis, Minnesota. This is a scientific meeting with both papers as well as symposia.



Editor's Notebook

Editor's Report to the House of Delegates

This is my ninth Editor's Report. Previously, I have dealt with internal matters — budgets, advertising revenues, printing expenses, and editorial contents. I have even imposed upon you my thoughts on composing articles.

Outside World

In this report, I shall turn to the outside world by comparing MINNESOTA MEDICINE to other State Journals. I have three reasons for doing so: (1) I think we learn something about ourselves by comparing MINNESOTA MEDICINE to other Journals; (2) I believe looking at these Journals may teach us something about MINNESOTA MEDICINE'S future — its role, its limitations, and its opportunities; and (3) I see this as a good exercise for visualizing the demographic and economic realities facing State Journals.

Bare Facts

So much for prologue, now for bare facts. MINNESOTA MEDICINE is a State Medical Journal, owned and operated by the Minnesota Medical Association. As a state journal, we have a circulation of 6,700, a total budget of about \$148,000, (revenues of roughly \$83,000, one full-time Associate Editor (Elaine Nye), one part-time Chief Editor (myself), and a Board of 70 voluntary Editors (see masthead for names)). The Minnesota Medical Association, in its turn, is a professional association with an annual budget of about \$1.6 million, supported mainly by 5500 Minnesota dues-paying physicians. The Association employs 28 people, one of whom devotes full-time effort to MINNESOTA MEDICINE. Of the total budget of the Association (\$1.6 million as originally adopted), MINNESOTA MEDICINE requires \$65,000 in addition to its revenues to meet its expenses. This amounts to roughly five percent of the Association's budget, or about \$15 a member each year.

The Other Journals

MINNESOTA MEDICINE is one of 41 journals of state medical societies (other societies have bulletins, newsletters, or related means of communication). These journals function under various formats. In the West, for example, *The Western Journal of Medicine*, formerly *California Medicine*, serves as a state journal for California, Idaho, Nevada, New Mexico, Utah, Washington, and Wyoming. In the East, the *New England Journal of Medicine*, besides being a paying subscription journal for over 190,000 students and physicians outside of Massachusetts, is the official publication of the Massachusetts Medical Society. For the most part, however, most state journals are the sole offspring of one parent state association. Thirty-two state journals, including MINNESOTA MEDICINE, are members of the State Medical Journal Advertising Bureau (SMJAB), an organization that solicits national pharmaceutical advertising for its members.

To give you an idea of how MINNESOTA MEDICINE compares to other journals in circulation and in circulation as a percent of non-federal physicians in each state, I have prepared Table 1.

EDITOR'S NOTEBOOK

TABLE 1

State Medical Journals — Circulation of Each Journal, Number of Non-Federal Physicians in Each State, and Circulation as Percent of Number of Physicians

<i>Journal of State</i>	<i>Current Circulation</i>	<i>Number of Non-Federal Physicians</i>	<i>Circulation as Percent of Non-Federal Physicians</i>
1. <i>New England Journal of Medicine</i> (total circulation is 206,500 but only 10,410 copies go to Massachusetts Medical Society members)	10,410	15,000	68%
2. <i>New York State Journal of Medicine</i>	27,000	47,000	57%
3. <i>Western Journal of Medicine</i> (California, Idaho, Nevada, New Mexico, Utah, Wyoming, Washington)	47,000	65,700	72%
4. <i>Texas Medicine</i>	18,700	20,100	93%
5. <i>Pennsylvania Medicine</i>	15,000	22,500	67%
6. <i>Illinois Medical Journal</i>	15,400	18,400	83%
7. <i>Journal of Florida Medical Association</i>	14,000	18,400	76%
8. <i>Ohio State Medical Journal Association</i>	12,000	17,300	69%
9. <i>Journal of Medical Society of New Jersey</i>	10,500	13,800	76%
10. <i>Physician East</i>	9,800	—	—
11. <i>Chicago Medicine</i>	9,100	—	—
12. <i>Michigan Medicine</i>	9,000	14,300	63%
13. <i>Minnesota Medicine</i>	6,700	7,700	87%
14. <i>Virginia Medical</i>	6,700	8,700	77%
15. <i>Maryland State Medical Journal</i>	6,200	10,400	60%
16. <i>Missouri Medicine</i>	6,200	7,800	79%
17. <i>North Carolina Medical Journal</i>	6,100	8,400	73%
18. <i>Wisconsin Medical Journal</i>	5,600	7,300	77%
19. <i>Journal of Indiana Medical Association</i>	5,500	7,000	79%
20. <i>Connecticut Medicine</i>	5,400	7,700	70%
21. <i>Journal of Tennessee Medical Association</i>	5,200	7,800	67%
22. <i>Journal of Medical Association of Georgia</i>	5,000	7,000	71%
23. <i>Colorado Medicine</i>	5,000	5,600	89%
24. <i>Journal of Louisiana Medical Society</i>	4,800	6,000	80%
25. <i>Journal of Medical Association of Alabama</i>	4,200	4,600	91%
26. <i>Journal of Kentucky Medical Association</i>	4,100	4,700	87%
27. <i>Journal of Iowa Medical Society</i>	3,400	3,000	> 100%
28. <i>Journal of Kansas Medical Society</i>	3,200	3,000	> 100%
29. <i>Journal of Oklahoma Medical Society</i>	3,000	3,700	81%
30. <i>Arizona Medicine</i>	2,900	4,900	59%
31. <i>Boletín Asociación Médica de Puerto Rico</i>	2,800	—	—
32. <i>Journal of South Carolina Medical Association</i>	2,700	3,800	71%
33. <i>Journal of Arkansas Medical Society</i>	2,600	2,600	100%
34. <i>West Virginia Medical Society Journal</i>	2,600	2,600	100%
35. <i>Journal Mississippi State Medical Society</i>	2,300	2,600	86%
36. <i>Nebraska Medical Journal</i>	2,000	2,300	87%
37. <i>Rhode Island Medical Journal</i>	1,700	2,000	85%
38. <i>Delaware Medical Journal</i>	1,300	1,000	> 100%
39. <i>South Dakota Journal of Medicine</i>	1,000	800	> 100%
40. <i>Alaska Medicine</i>	800	500	> 100%

What can you learn from this information? You learn the obvious:

- For the most part, the number of physicians in a given state limits the circulation of its journal. Even if 100 percent of the physicians in every state were to join their medical societies (an unlikely scenario in these days of declining AMA membership), circulations in each state would remain limited. Circulation may increase significantly by 1990 because 30 percent more physicians will be in practice, but these gains will not be dramatic if organized medicine's membership continues to dwindle.
- State journal circulations can be made to grow by two methods: (a) by increasing the number of paid subscribers outside the state, in the fashion of the *New England Journal of Medicine*, or (b) by consolidating journals of other states into one journal, in the style of the *Western Journal of Medicine*.

EDITOR'S NOTEBOOK

The Options

What are the options for MINNESOTA MEDICINE ?

Should it remain strictly Minnesota-based, serving as a standard bearer for the excellence of medicine in this state? This plan has merits: (1) It keeps our staff the same, thereby limiting expenses; (2) It avoids an identity crisis; and (3) It relies on proven strengths of a tradition dating back to 1909.

This is the path most state journals have chosen, and it has unquestionable merits of familiarity.

Should we go the *New England Journal* route? In considering this option, keep in mind that a large journal operation has three distinct divisions: business, production, and editorial. Such an operation requires a business manager with promotional flair, sophisticated production techniques (printing, layout, distribution), and a deep editorial staff with strong support services (library, secretarial, and word processing). Here the *New England Journal* story is instructive.

In 1951, Editor Joseph Garland, decided to reorganize his journal.¹ At that time, the journal had 25,000 subscribers, three quarters of whom were outside the Massachusetts Medical Society. The *Journal* was well known to the academic world and to practicing physicians who had served in World War II and who had received gift subscriptions as a patriotic act on the part of the *Journal*.

Upon becoming Editor in 1947, Garland diversified the *Journal's* contents, but changes had little impact on subscriptions. To bolster lagging subscriptions, Garland engaged the editor of the *Harvard Business Review* as a consultant, and he recommended a full-time business manager. In 1952, Milton Paige became business manager and initiated a series of promotional campaigns — mail promotions, premiums, life-time subscriptions, and a European edition.² The *Journal* now has a Subscriber Service Division of 35 people, all devoted to enlisting new subscribers, persuading old subscribers to resubscribe, and maintaining the computer mailing lists.

This emphasis on promotion has worked. The *Journal* grew from 25,000 in 1951 to 167,000 in 1967, to 202,000 today. According to the late Franz Ingelfinger, editor from 1967 to 1977: "Regardless of the quality of a medical publication, subscription lists grow but slowly if promotion is ineffective."³ The *Journal's* growth stems from successful integrating of its business, production, and editorial functions. Academic purists who decry the business side of medical journals should note that 44 to 50 percent of the "prestigious" *New England Journal's* pages are devoted to advertising.³

Circulation size is important for the journal and the advertisers. For a journal, advertising revenues make for a larger journal, higher quality printing, and more support services. It is no accident that those general medical publications with the greatest prestige have large circulations and emanate out of organizations with large assets — the *New England Journal* has a budget of over \$7,000,000 a year. The AMA has a budget of nearly \$100 million and is the largest publisher of medical literature in the world, and the Mayo Clinic is an institution with annual revenues of \$250 million a year.

For the advertiser, journals with large circulations are more cost efficient in reaching readers. In other words, advertisers get more bang for their buck in the big journals (Table 2).

TABLE 2
Circulation and Page Rates, and Cost to Reach Readers per Page

<u>Journal</u>	<u>Circulation</u>	<u>Rate/Page</u>	<u>Cost to reach reader per page</u>
<i>New England Journal of Medicine</i>	202,000	\$1,680	0.8¢
JAMA	270,000	\$3,675	1.4¢
<i>Mayo Proceedings</i>	86,500	\$1,625	1.9¢
MINNESOTA MEDICINE	61,700	\$ 208*	3.1¢

*\$208 is MINNESOTA MEDICINE's National Rate. For local advertisers selling to reach a targeted audience, viz the physicians of Minnesota, we charge \$450. We expect to raise about \$30,000 in local advertising in 1983.

EDITOR'S NOTEBOOK

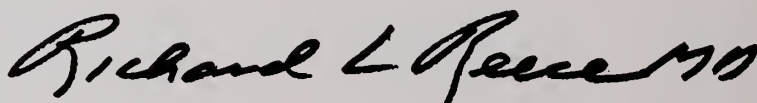
In my opinion, we should not try the *New England Journal* route. The environment is simply not favorable — advertisers are now catering to the controlled-circulation journals ("throwaways"), pharmaceutical firms are marketing fewer drugs, academic researchers prefer to publish in specialty journals, production costs are continuing to rise, the greatest demand for dues-money is in the socio-economic arena, the Internal Revenue Service is harassing all medical journals that show any hint of profit, and too much time, money, and resources are required to build that requisite prestige.

Even excellent journals are having trouble in these economic times. Here is the editor of the *Mayo Clinic Proceedings* talking in 1981:⁴ "The economics of journal publishing have progressively deteriorated since I became editor five years ago. I won't take credit for that. Everyone is aware of the escalating postage costs, but not everyone realizes how much the printing and paper costs have increased and how they continue to increase each year. Revenue from advertising pays for almost 70% of our publishing and distribution costs, but the remaining deficit is quite considerable."

This leaves the last option:

Should we try the *Western Medical Journal* approach — merging multiple state journals into a regional journal. For example, if Minnesota, Wisconsin, the Dakotas, Nebraska, and Iowa were to get together to form the *Midwest Medical Journal*, the new publication would have a circulation of nearly 20,000, making it bigger than *Texas Medicine*. The latter would have a dubious distinction, but it would give the organized states greater advertising clout and appeal and would cost each state organization less money to support a journal. One way for each state to retain its pride in its own identity would be to have a state organization insert for each state to be distributed only to that state. This idea has been around for ten years, but it has floundered because of questions of parochial pride. Who would be the editor? Where would the editorial headquarters be? What state would such a journal be published in?

Nonetheless, such difficult questions aside, the idea has economic soundness. Enough so perhaps the editors of the *Midwestern State Journals* ought to get together and invite the editor and business manager of the *Western Medical Journal* to hear the case for a consolidated journal.



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Continuing Medical Education

Minnesota Association of Blood Banks Spring Meeting

Friday, May 6, 1983 — Sunwood Inn, St. Cloud

Registration fee: Members \$12, Nonmembers \$16, Students \$8

Registration Deadline: April 20, 1983 (Late registrants may not be guaranteed lunch)

Contact: Yvonne Schrank, 1421 Ninth Avenue, S.E., St. Cloud, MN 56301.

Application has been submitted for 6 hours of CME credits.

Double Barrelled Common Bile Duct

CHARLES E. MORROW, M.D.* and DAVID E.R. SUTHERLAND, M.D.†

A patient was seen 30 years after cholecystectomy because of recurrent episodes of pancreatitis and jaundice. ERCP showed an apparent stone in the distal common bile duct. At exploration, the stone was found to reside in a cystic duct remnant that shared a common wall with the common hepatic duct. This case illustrates one of the anomalies of the biliary tree that can perplex the surgeon and cause problems when operating on the biliary system.

A PATIENT PRESENTED 30 years after cholecystectomy with obstructive jaundice and choledocholithiasis presumably secondary to a cystic duct or gallbladder remnant. A biliary anomaly, the double barrelled common bile duct, was not immediately recognized and posed interesting diagnostic and therapeutic challenges. Combined information from ERCP, intraoperative cholangiography and careful surgical exploration resulted in safe and curative treatment.

The anatomic variability of the biliary system has been well documented. Bile duct injuries and biliary leaks are very often the result of failure to recognize anomalous biliary anatomy. One such unusual anomaly, the double barrelled common bile duct, is the subject of this communication

*Department of Surgery, University of Minnesota Hospitals, Minneapolis, Minnesota.
Reprints: Dr. C.E. Morrow, Box 314, 420 Delaware Street, S.E., University of Minnesota, Minneapolis 55455.

Case Report

A 60-year-old woman was admitted to the University of Minnesota Hospitals for evaluation of abdominal pain and jaundice. Over the previous two years she had experienced repeated bouts of acute pancreatitis. There was no history of alcoholic ingestion. Of note, 30 years earlier the patient had an uncomplicated cholecystectomy for cholelithiasis. An ERCP, performed one month earlier following a similar painful attack, was interpreted as normal with filling of a large cystic duct remnant. Total serum bilirubin was 6.2 mg%, and direct serum bilirubin was 3.8 mg%. Serum alkaline phosphatase was 339 IU/L (normal < 220) and serum amylase was normal. A laparotomy was done. The result of an intraoperative cholangiogram performed via the cystic duct remnant is shown in the Figure (left side). The radiograph was interpreted as

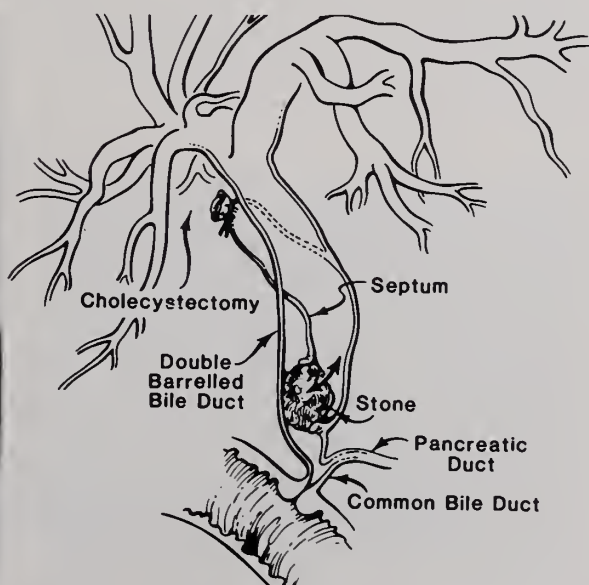
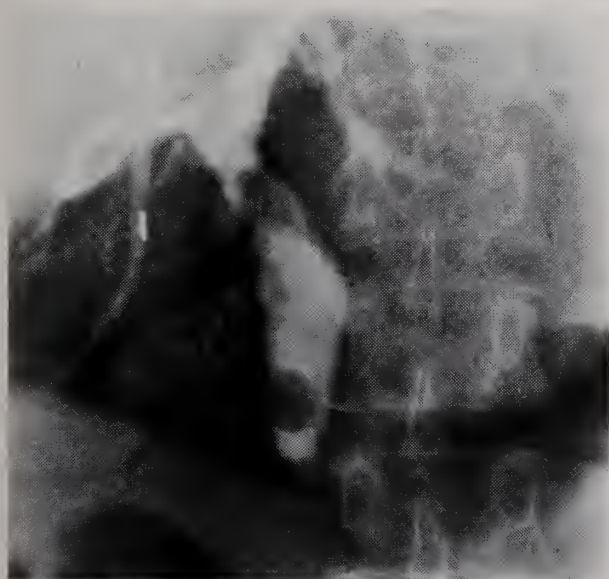


Figure — Intraoperative cholangiogram (left) demonstrating choledocholithiasis within the cystic duct channel of a double barrelled common bile duct. The long obstructed parallel cystic duct is separated from the common bile duct by a membranous septum and enters posteriorly approximately 1 cm from the ampulla of Vater (schematic on right).

showing a rather large stone (1 cm) in the distal common bile duct. A longitudinal incision was made in the antero-medial wall of the common bile duct. A red Robinson catheter inserted into the bile duct incision passed easily into the duodenum. This surprised us, and we wondered where the stone, visualized on cholangiography, was located. After mobilizing the duodenum, palpation of the intrapancreatic portion of the common bile duct revealed minimal induration; however, just proximal to the pancreatic portion of the common bile duct a large stone was palpable. The stone was freely movable and could be manipulated into the area of the choledochotomy, but it could not be delivered into the lumen of the common bile duct. Since we were unable to pass the red Robinson catheter into the gallbladder remnant, we made a separate incision in to what we believed was the posterior wall of the common bile duct. The cholesterol stone was removed through this incision. The catheter could also be passed distally into the duodenum and proximally into the gallbladder remnant. It was, therefore, apparent that there was a long cystic duct running parallel through this incision and sharing a common membranous wall with the common hepatic duct (Figure, right side). The cystic duct entered the common bile duct 1 cm. proximal to the ampulla. The septum was excised, the gallbladder remnant was resected, and the choledochotomy was closed over a T-tube. A T-tube cholangiogram revealed a wide common bile duct without residual calculi. Pathologic examination of the septum revealed fibrous tissue without any muscular element. The patient recovered and has remained asymptomatic two years after removal of the cystic duct stone.

Discussion

The double barrelled common bile duct is the result of disproportionate embryologic growth rates and failure of normal tissue resorption of the anlagen of adult ductal structures. Early descriptions of parallel cystic and common hepatic ducts date to 1918.¹ Hayes, et al.² reviewed detailed records of 400 surgical biliary procures, and discovered anomalies in 189 patients. Accessory ducts (38%) and low junction of the cystic and common hepatic ducts (48%) were the most frequent anomaly. A single case of a long parallel cystic and common hepatic duct separated by a mucosal septum was included. In 199 autopsied cases, Moosman and Collier³ found a long parallel course between the cystic and common hepatic ducts in 11 patients (4.4%).

Disastrous results have been reported after failure to recognize the double barrelled common bile duct anatomy when using the gallbladder for biliary drainage following pancreaticoduodenectomy⁵ or liver allotransplantation.⁴

In our patient, the retained gallbladder remnant was most likely responsible for choledocholithiasis. The recurrent episodes of acute pancreatitis and jaundice are explained by a ball-valve mechanism with the stone shuttling between the cystic duct and the common duct near the ampulla. This anomaly can be difficult to recognize and under certain circumstances can be responsible for complications in surgery involving the bile duct.

Acknowledgments

The manuscript was prepared by Janet Sanders and the illustrations by Mary Albury.

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Physician in the News

Jane E. Hodgson, M.D. has accepted a six months Visiting Professorship, Department of Obstetrics, Gynecology and Reproductive Sciences, The University of California Medical Center, San Francisco, California.

Fatal Fat Embolism Following Total Knee Arthroplasty

ROBERTA L. ZIMMERMAN, B.A.;* LUDWIG F. KRONER III, M.D.;† DAVID J. BLOMBERG, M.D.;‡
and DONALD J. NOLLET, M.D.‡‡

A case of fatal fat embolism syndrome following total knee arthroplasty unrecognized until autopsy is described. In the non-traumatic setting this condition is frequently mis-diagnosed. Since the only effective treatment measures must be instituted very early, a heightened awareness of this diagnostic possibility in the post-surgical patient, particularly the orthopedic patient, is important.

ZENKER, in 1862, was the first to describe the pathologic findings in fat embolism, demonstrating fat in the pulmonary capillary bed of a railroad worker who died following a crush injury.²⁵ Eleven years later Von Bergman published the first clinical description of the fat embolism syndrome, describing the clinical and pathologic changes in a thirty-year old man who injured his leg in a fall from a roof.²⁴ Since these initial descriptions, fat embolism has not only been recognized as a complication of long bone fractures but it has also been associated with such diverse conditions as soft tissue trauma,³ extensive burns,²² subatmospheric decompression,¹³ hematogenous osteomyelitis, diabetes mellitus,⁷ sickle cell crisis,⁶ extracorporeal circulation,¹⁸ various poisonings,^{7,17} pancreatitis,¹⁵

and extreme fatty metamorphosis of the liver secondary to alcoholism.¹⁶ Although previously reported several times as a fatal complication of total hip arthroplasty,¹¹ there is only one reported case of fatal fat embolism following total knee arthroplasty.⁸ We report an additional case along with a review of the current information concerning pathogenesis, diagnosis, and treatment.

Case Report

A 78-year-old white male was admitted to the Central Mesabi Medical Center with the complaint of severe right knee pain, aggravated by a fall several weeks previously. This knee had been deformed as a result of childhood trauma. Osteomyelitis of the left hip and right shoulder more than sixty years ago, treated by surgical incision and drainage, resulted in a shortened left leg with additional disablement. The osteomyelitis had been inactive since that time. Other medical problems included moderate hypertension and a previously resected bladder cancer, currently not clinically evident.

X-Ray evaluation of the right knee showed complete loss of the joint with extreme bony overgrowth, spurring, and osteophyte formation. X-rays of the left hip revealed ankylosis and marked pelvic obliquity.

Physical examination demonstrated a 40° flexion contracture and

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Fig. 1 — Photograph of section of brain showing diffuse petechial hemorrhages throughout white and grey matter of cerebrum, cerebellum and pons.

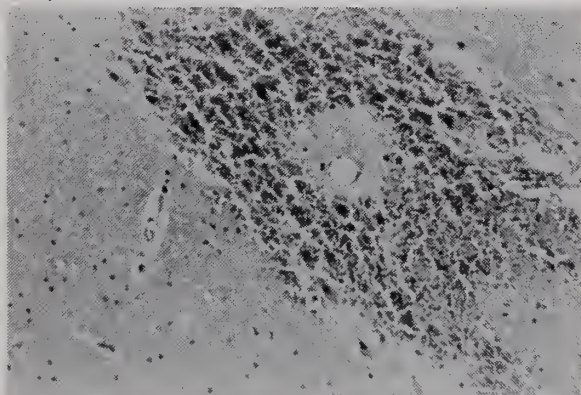


Fig 2 — Photomicrograph of sub-cortical white matter showing distended capillaries surrounded by hemorrhage. Many neurons show changes of ischemia (100X before reduction).

20° varus deformity of the right knee with marked crepitation. The left hip had a 15° flexion contracture with 25-30° additional flexion possible. There was some shortening of the left leg, and the right hip and left knee were essentially normal. The diagnosis was considered to be osteoarthritis with severe degeneration of the right knee joint and a right total knee arthroplasty was suggested.

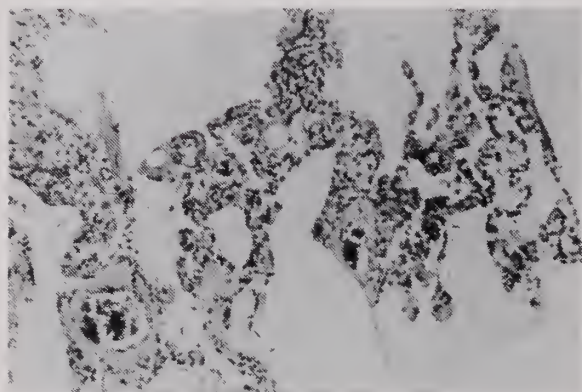


Fig. 3 — Photomicrograph of lung showing congestion, pulmonary edema and capillary distention (100 X before reduction).

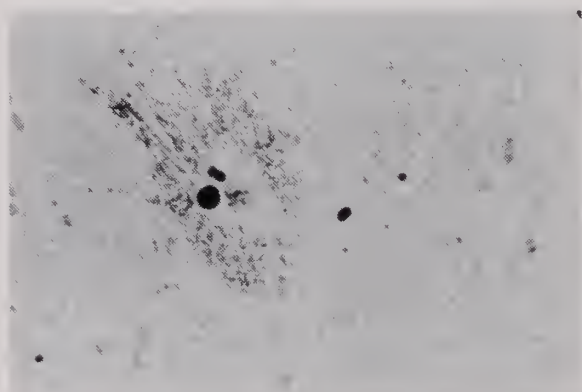


Fig. 4 — Section of brain showing fat emboli (black) occluding several capillaries (Osmium tetroxide stain) (100 X before reduction).

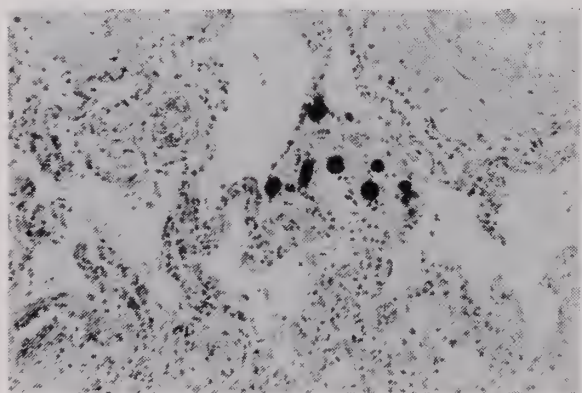


Fig. 5 — Section of lung showing fat emboli occluding several capillaries (Osmium tetroxide stain) (100 X before reduction).

Pre-operative laboratory data included a hemoglobin of 15.5 gm%, normal renal and liver function studies, and a mildly elevated fasting blood glucose of 133 mg%. A sample of arterial blood revealed a pH of 7.32, $p\text{CO}_2$ 47 mmHg., $p\text{O}_2$ 71 mmHg. An electrocardiogram was unremarkable and a chest x-ray was normal for age showing mild cardiomegaly.

Surgery was performed with Ethrane as the anesthetic agent. Using a pneumatic tourniquet inflated to 350 mmHg, the joint was exposed revealing a hemarthrosis. A total condylar arthroplasty was performed using a Zimmer prosthesis which required the use of an intra-medullary alignment rod as a guide. No intra-medullary reaming was performed other than to accommodate this rod. The patient was monitored throughout the procedure and his blood pressure never fell below 130/80 mmHg. Approximately thirty minutes after commencing the operation a sample of arterial blood revealed a pH of 7.37, $p\text{O}_2$ of 108 mm Hg, $p\text{CO}_2$ of 40 mmHg. In all other respects the operation appeared uneventful with a tourniquet time of 103 minutes and the patient was transferred to the recovery room in satisfactory condition.

Upon arrival in the recovery room his blood pressure was 170/95 mmHg. Over the next ninety minutes his blood pressure varied from 140/70 mmHg. to 165/80 mmHg. His blood pressure then became unstable, varying irregularly from 150/80 mmHg. to 100/70 mmHg. over the next thirty minutes. Over a short period of time the patient became comatose with no response to pain, no spontaneous motion, and some decerebrate posturing. No petechiae were noted and the lungs and heart were unremarkable. A sample of arterial blood revealed a pH of 7.37, $p\text{CO}_2$ of 36 mm Hg, and $p\text{O}_2$ of 66mmHg. A spinal tap was unremarkable. A chest Xray showed bilateral congestion, more prominent in the upper lung fields. An EKG showed a right bundle branch block. He was thought to have a global encephalopathy, possibly on an anoxic basis.

By the following day there was slight evidence of clinical improvement although he remained comatose and required vasopressors and fluids to support his blood pressure. A urinalysis did not demonstrate fat globules and serial enzyme studies did not suggest myocardial injury. Over the next two days his vital signs stabilized but he remained comatose. His chest x-ray improved but the congestive pattern remained. An electroencephalogram suggested a diffuse encephalopathy with no focal abnormalities. He became febrile and expired on the eight post-operative day.

Pathologic Findings

Significant findings at autopsy included generalized cerebral edema with diffuse petechial hemorrhages throughout both white and grey matter (Figure 1), generalized atherosclerosis, visceral congestion, areas of atelectasis, and bronchopneumonia. Histologic examination revealed multiple areas of hemorrhage throughout the cerebral hemispheres, pons and cerebellum, with neuronal necrosis. Capillaries in many of these hemorrhagic areas were widely patent and tensely distended. (Figure 2) The lungs showed extensive pulmonary edema with congestion and atelectasis. As in the brain, many of the capillaries in these areas were widely patent and distended. (Figure

3) Sections stained for fat with osmium tetroxide demonstrated diffuse fat emboli throughout the microvasculature of the brain, lungs and kidneys. (Figures 4 and 5). Other significant histologic findings included early bronchopneumonia and moderate fatty metamorphosis of the liver with some foci of centrilobular necrosis.

Discussion

Clinical findings present in the fat embolism syndrome include petechiae over the neck, axillae and upper thorax, respiratory distress, pyrexia and changes in level of consciousness. Evidence of ischemia and right-sided strain may be seen on the electrocardiogram and a chest X-Ray frequently reveals bilateral diffuse infiltrates. A rising serum lipase and demonstration of fat globules in the urine and blood help confirm the diagnosis.¹⁹

The incidence of the syndrome is reported to be between 0.6% and 55% with a 5% to 85% mortality.¹⁴ It is most common after femoral fractures with additional injuries. The risk is increased by manipulation and motion of the fracture and decreased by tourniquet application and elevation. The highest mortality rates are seen when dehydration and pre-existing shock are present.¹⁰

The pathologic findings vary with the time of death. Patients who expire less than five hours after fat embolism occurs may demonstrate only serosal petechiae and pulmonary congestion. In cases surviving more than five hours the lungs are congested, atelectatic, and hemorrhagic with edema, acute inflammatory change and intravascular fat globules. The right ventricle is dilated and shows congestion, focal necrosis, acute inflammatory change, and intravascular fat globules. The liver is congested and enlarged with fatty metamorphosis, centrilobular necrosis and an inflammatory infiltrate. Fat globules are seen in the glomeruli of the kidneys. The microvasculature throughout the brain also contains fat globules with areas of infarction and hemorrhage.¹

There are two main theories concerning the etiology of fat embolism. The oldest is the mechanical theory, first proposed by Gauss in 1924,⁵ who suggested that fat from the marrow enters the blood stream following a mechanical disturbance. This has been demonstrated experimentally both by long bone fracture and by slow intravenous administration of neutral fat globules.¹³ Additional experiments, however, have failed to show that the quantity of fat released following fracture is sufficient to cause fat embolism.¹⁴ Fat embolism is also known to occur without fracture or trauma and the

fat comprising the emboli differs chemically from marrow fat, containing more cholesterol.⁴ Furthermore, if fat embolism occurred only on a mechanical basis, the lungs should act as a filter, thereby protecting the other body organs. Yet, fat emboli are found systematically.

The alternate etiologic theory is the biochemical theory, first proposed in 1927 by Lehman and Moore.¹² In their opinion the mechanical theory was incomplete, as it failed to explain the development of the fat embolism syndrome in the absence of trauma. Endogenous plasma lipids, normally present as an emulsion, were considered an important source of fat emboli. Their experiments indicated that this emulsion was broken by pH changes, extracts of decomposing protein, salts or heavy metals, and histamine, leading them to speculate that trauma and some disease states alter the plasma lipid emulsion, resulting in formation of neutral fat globules which lodge as emboli in the microvasculature. Liljedahl and Westermarck¹⁴ proposed that these emboli become coated with platelets, leading to the thrombocytopenia and purpura seen in the syndrome, and are subsequently degraded into free fatty acids. Catecholamine release also occurs following trauma or stress, resulting in the formation of additional free fatty acids. These free fatty acids are tissue toxic, producing vesiculation, thickening of capillary and alveolar walls and changes in capillary permeability.²⁰

Both the emboli themselves and the toxic changes caused by the fatty acids result in hypoperfusion. The trauma induced erythrocyte and platelet aggregation further decreases pulmonary perfusion, causing defects in the surfactant system with resulting atelectasis⁹ and multiple areas of cerebral infarction.

Perhaps the most effective means of reducing mortality is to anticipate the syndrome and initiate treatment as early as possible. Additional prophylactic measures include minimal manipulation and early reduction of fractures. Use of a tourniquet during orthopedic surgery and elevation of fractured limbs have also been suggested. Stoltenberg and Gustilo demonstrated that prophylactic administration of methylprednisolone and hypertonic glucose were beneficial in long bone fracture.²³

Treatment of fat embolism is essentially that of shock. The regimen outlined by Oh and Mital²⁰ places great emphasis on the support of respiration, attempting to maintain a pO_2 of at least seventy mm. Hg. Corticosteroids in high doses decrease cerebral edema, act as an anti-inflammatory agent and decrease platelet adhesiveness. Blood components,

albumin and colloids are given as needed and pulmonary edema treated aggressively. Antibiotics to prevent respiratory tract infection have also been advocated.

Oh and Mital do not recommend the use of heparin, as heparin-induced activation of lipoprotein lipase further increases free fatty acid levels. Others believe that early use of heparin is useful to break down fat emboli and act as an anti-inflammatory agent.² Infusion of such agents as 5% IV alcohol, dextran, the antilipemic Clofibrate, the emulsifier Decholin, and the detergent Pluronic F-68 are no longer acceptable.²⁰

Few factors predisposing to fat embolism are present in this case. The patient was essentially healthy with none of the conditions associated with non-traumatic fat embolism. He did undergo an orthopedic procedure with the trauma that accompanies all such surgery. Either etiologic theory of the pathogenesis of the fat embolism syndrome could be evoked in this case. It is important to realize how rapidly the syndrome can develop and how few prophylactic measures are available, but, as indicated above, the best chances for patient survival are those in which the diagnosis is made quickly and treatment instituted.

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Cover Photograph "Hawaiian Sunset"

Dr. Reinhold O. Goehl and his wife, together with their three daughters, went to four of the Hawaiian Islands for some "fun in the sun." This was in February, 1978, and the cover sunset photograph was taken during that time.

Sunsets along the Kona Coast on the "Big Island" of Hawaii are reportedly some of the most beautiful in the world. This is where the cover photograph was taken.

Dr. Goehl used his long time favorite Nikon Camera. The film was Ektachrome 64.

Over the past years, Dr. Goehl's photographs have graced the covers of MINNESOTA MEDICINE. He has been a winner of the MINNESOTA MEDICINE best cover award, and many times a runner-up for the award.

Our Faces are Red

In the March issue of MINNESOTA MEDICINE* in the cover description we listed Dr. John K. Meinert as being associated with the Mayo Clinic. Dr. Meinert is an internist with the Willmar Clinic.

*Page 134.

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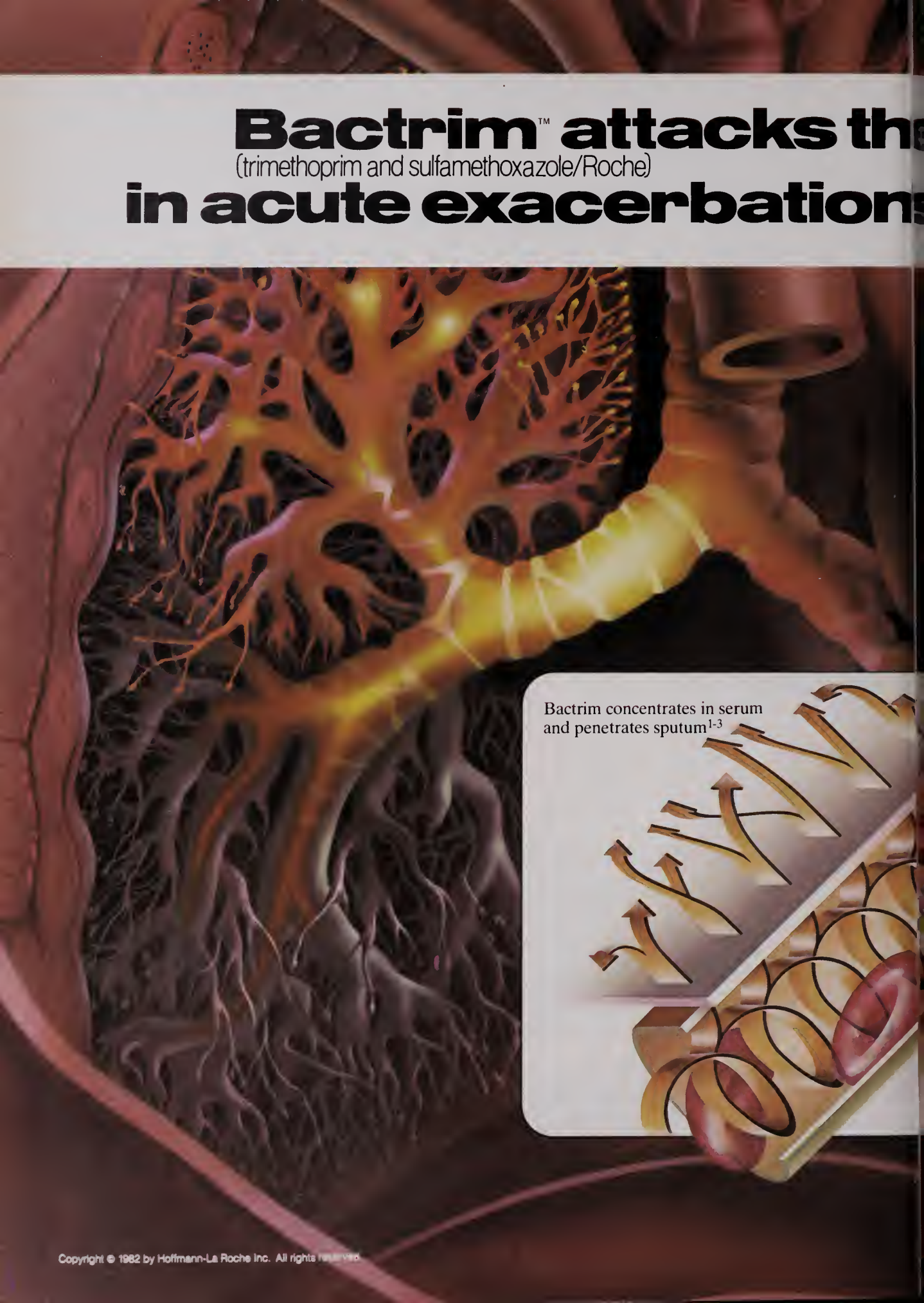
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Bactrim reduces coughing
and sputum production

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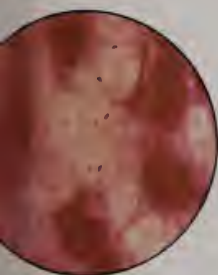
involving nearly 700 patients.¹⁰ Overall clinical condition of the patients, changes in sputum purulence, reduction in sputum volume and microbiological clearance of pathogens—all improved more with Bactrim therapy than with tetracyclines. G.I. side effects occurred in only 7% of patients treated with Bactrim compared with 12% of tetracycline-treated patients. (See Adverse Reactions in summary of product information on next page.)

Bactrim is contraindicated in pregnancy at term and nursing mothers, infants under two months of age, documented megaloblastic anemia due to folate deficiency and hypersensitivity.

Bactrim DS. For acute exacerbations of chronic bronchitis in adults* when it offers an advantage over single-agent antibacterials.

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s *H. influenzae*—even
ampicillin-resistant strains



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Indications and Usage: For the treatment of urinary tract infections due to susceptible strains of the following organisms: *Escherichia coli*, *Klebsiella-Enterobacter*, *Proteus mirabilis*, *Proteus vulgaris*, *Proteus morganii*. It is recommended that initial episodes of uncomplicated urinary tract infections be treated with a single effective antimicrobial agent rather than the combination. **Note:** The increasing frequency of resistant organisms limits the usefulness of all antibacterials, especially in these urinary tract infections.

For acute otitis media in children due to susceptible strains of *Haemophilus influenzae* or *Streptococcus pneumoniae* when in physician's judgment it offers an advantage over other antimicrobials. To date, there are limited data on the safety of repeated use of Bactrim in children under two years of age. Bactrim is not indicated for prophylactic or prolonged administration in otitis media at any age.

For acute exacerbations of chronic bronchitis in adults due to susceptible strains of *Haemophilus influenzae* or *Streptococcus pneumoniae* when in physician's judgment it offers an advantage over a single antimicrobial agent.

For enteritis due to susceptible strains of *Shigella flexneri* and *Shigella sonnei* when antimicrobial therapy is indicated.

Also for the treatment of documented *Pneumocystis carinii* pneumonia.

Contraindications: Hypersensitivity to trimethoprim or sulfonamides; patients with documented megaloblastic anemia due to folate deficiency; pregnancy at term; nursing mothers because sulfonamides are excreted in human milk and may cause kernicterus; infants less than 2 months of age.

Warnings: BACTRIM SHOULD NOT BE USED TO TREAT STREPTOCOCCAL PHARYNGITIS. Clinical studies show that patients with group A β -hemolytic streptococcal tonsillopharyngitis have higher incidence of bacteriologic failure when treated with Bactrim than do those treated with penicillin. Deaths from hypersensitivity reactions, agranulocytosis, aplastic anemia and other blood dyscrasias have been associated with sulfonamides.

Experience with trimethoprim is much more limited but occasional interference with hematopoiesis has been reported as well as an increased incidence of thrombopenia with purpura in elderly patients on certain diuretics, primarily thiazides. Sore throat, fever, pallor, purpura or jaundice may be early signs of serious blood disorders. Frequent CBC's are recommended; therapy should be discontinued if a significantly reduced count of any formed blood element is noted.

Precautions: General: Use cautiously in patients with impaired renal or hepatic function, possible folate deficiency, severe allergy or bronchial asthma. In patients with glucose-6-phosphate dehydrogenase deficiency, hemolysis, frequently dose-related, may occur. During therapy, maintain adequate fluid intake and perform frequent urinalyses, with careful microscopic examination, and renal function tests, particularly where there is impaired renal function. Bactrim may prolong prothrombin time in those receiving warfarin; reassess coagulation time when administering Bactrim to these patients.

Pregnancy: Teratogenic Effects: Pregnancy Category C. Because trimethoprim and sulfamethoxazole may interfere with folic acid metabolism, use during pregnancy only if potential benefits justify the potential risk to the fetus.

Adverse Reactions: All major reactions to sulfonamides and trimethoprim are included, even if not reported with Bactrim. **Blood dyscrasias:** Agranulocytosis, aplastic anemia, megaloblastic anemia, thrombopenia, leukopenia, hemolytic anemia, purpura, hypoprothrombinemia and methemoglobinemia. **Allergic reactions:** Erythema multiforme, Stevens-Johnson syndrome, generalized skin eruptions, epidermal necrolysis, urticaria, serum sickness, pruritus, exfoliative dermatitis, anaphylactoid reactions, periorbital edema, conjunctival and scleral injection, photosensitization, arthralgia and allergic myocarditis. **Gastrointestinal reactions:** Glossitis, stomatitis, nausea, emesis, abdominal pains, hepatitis, diarrhea, pseudomembranous colitis and pancreatitis. **CNS reactions:** Headache, peripheral neuritis, mental depression, convulsions, ataxia, hallucinations, tinnitus, vertigo, insomnia, apathy, fatigue, muscle weakness and nervousness. **Miscellaneous reactions:** Drug fever, chills, toxic nephrosis with oliguria and anuria, periarteritis nodosa and L.E. phenomenon. Due to certain chemical similarities to some goitrogens, diuretics (acetazolamide, thiazides) and oral hypoglycemic agents, sulfonamides have caused rare instances of goiter production, diuresis and hypoglycemia in patients; cross-sensitivity with these agents may exist. In rats, long-term therapy with sulfonamides has produced thyroid malignancies.

Dosage: Not recommended for infants less than two months of age.

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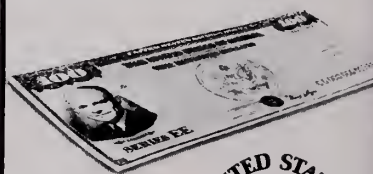
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Rheumatology Corner

The Foot in Rheumatic Disease

("Hands On" Examination)

PAUL BILKA M.D.*

The Forefoot

The joints in the foot, after those of the hand, are the most frequently involved in the rheumatoid patient. Yet the foot is one of the most inadequately examined areas. This should not be, because a good physical examination-especially careful palpation-is a rather simple but rewarding procedure. In rheumatoid arthritis, for example, the often missed synovitis of the metatarsophalangeal joints can be detected by the thick, boggy feel on deep pressure through the metatarsal head, which is quite tender. But in a "march fracture" the tenderness will be localized in the metatarsal bone itself, a half inch or so proximal to the metatarsal head. I have found this positive physical sign in several patients with "normal" Xrays where the fracture line was revealed only later when the reparative calcification became visible. Similarly in Morton's neuroma the tenderness is localized in the soft tissue between the metatarsal heads, usually in a slightly proximal direction, between the third and fourth toes. On occasion, even the enlarged fusiform nerve swelling can be palpated. To return to the rheumatoid foot: after several years, the active synovitis may "burn out" and leave dislocated metatarsophalangeal joints. These have a hard, bony feel, often with painful calluses. If shoe corrections with pads or metatarsal bars are inadequate, much help can be obtained from the surgical removal of the deformed joints.

Bunion deformity (hallux valgus) is ubiquitous. Pain may be due to the angulated distal toe, the enlarged metatarsal head, or to the resultant inflamed bursa. However, an acutely painful, swollen first metatarsophalangeal joint (or foot) should raise the question of gout. Interphalangeal synovitis of the other toes is not common but should alert the examiner to the

presence of one of the atypical rheumatoid disorders such as Reiter's disease or psoriatic arthritis.

The Mid Foot

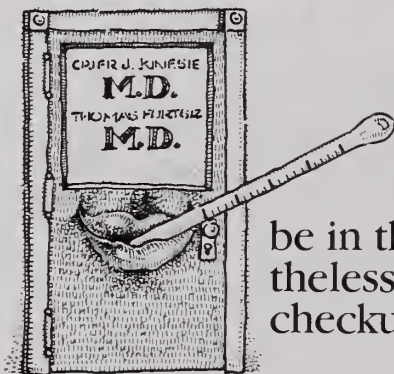
This is a much neglected area by the examiner. Methodical, firm palpation of the mid foot often reveals a linear swelling and tenderness that conforms exactly to the underlying intertarsal joint synovitis in rheumatoid arthritis. Bony lesions, such as osteomyelitis, can be separated by tenderness over the body of the tarsal bone. The cellulitis of gout can be differentiated by its more superficial and diffuse nature.

The Hind Foot

Ankle involvement by rheumatoid arthritis causes synovial swelling just below and anterior to the malleoli. This is readily differentiated from the more diffuse non-tender pitting edema. Also limited joint motion may occur at the ankle proper or the subtalar joint. Pronation deformity and foot eversion may add a significant mechanical problem and require arch supports or special shoes. Localized tenderness over the fibula malleolus may indicate a fracture. Bone tenderness over the os calcis may be due to the periostitis of ankylosing spondylitis. A deep tenderness at the plantar fascia insertion may also be present in this disorder, or in Reiter's disease. Tenderness at the achilles tendon insertion may be due to an apophysitis in the teenager (equivalent to Osgood-Schlatter's), or there may be a posterior calcaneal bursitis. Actual achilles tendon rupture should offer no diagnostic problem: dorsal foot flexion is painful and weak, and proximal palpation reveals the tendon defect. Bone tenderness of the lower tibia-fibula occurs in the periostitis of pulmonary osteoarthropathy of malignancy. Xray of the foot is usually a helpful aid in identifying the nature and extent of many foot problems.

*Rheumatologist, Minneapolis.

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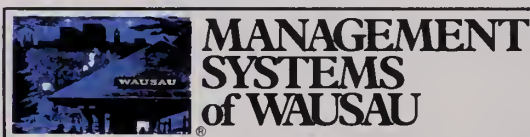
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Azotemia in Patients with Congestive Heart Failure Treated with Captopril

GORDON L. PIERPONT, M.D., Ph.D.;* T. BARRY LEVINE, M.D.* and JAY N. COHN, M.D.*

Three patients with severe refractory congestive heart failure developed impaired renal function when treated with the renin-angiotensin converting enzyme inhibitor, captopril. Increased serum urea nitrogen and concomitant hyperkalemia were reversible in each case. Patients with congestive heart failure treated with captopril should be followed closely for evidence of renal dysfunction or electrolyte imbalance.

THE RENIN-ANGIOTENSIN system has been postulated to play an important role in sustaining the high peripheral vascular resistance that is characteristically observed in severe congestive heart failure (CHF).^{1,2} This hypothesis has been supported by demonstration of hemodynamic improvement when such patients are treated with angiotensin converting enzyme inhibitors.¹⁻⁶ Although several studies document increases in cardiac output when captopril is used to treat CHF, reports on the renal response to captopril in these patients have been inconsistent.⁶⁻⁹ Since angiotensin is a potent renal vasoconstrictor, and the renal vascular bed in heart failure is probably preferentially constricted,^{10,11} it might be expected that inhibition of the formation of angiotensin would improve renal perfusion. We present the following three case studies to document that significant azotemia can occur when captopril is used to treat CHF.

Case Reports

Case 1

A 49-year-old white male presented in 1972 with dyspnea, orthopnea, paroxysmal nocturnal dyspnea, and atypical chest pain. Cardiac catheterization documented a diffuse congestive cardiomyopathy and mild mitral regurgitation with essentially normal coronary arteries. He was treated with digitalis and diuretics with intermittent use of vasodilators until February 1979 when a trial of captopril therapy was initiated. Hemodynamic monitoring of the initial response to 25 mg of captopril documented a decrease in pulmonary artery wedge pressure from 23 mm Hg to 8 mm Hg and increase in cardiac index from 2.8 L/min/M² to 3.5 L/min/M² while arterial blood pressure fell from 103/65 mm Hg to 82/47 mm Hg at peak drug effect. Because of this favorable response, chronic captopril (25 mg po t.i.d.) was added to his digitalis and diuretics for maintenance therapy.

The patient did reasonably well on this regimen, and a brief period during which captopril was discontinued resulted in exacerbation of

symptoms. However, his disease progressed and he was hospitalized in March 1980 with an ejection fraction by gated blood pool scan of only 4 to 9%. An increase in his diuretics and increase in captopril to 100 mg t.i.d. resulted in weight loss, but his blood urea nitrogen (BUN) increased from 41 mg/dl to 74 mg/dl. With a decrease in his diuretics, the BUN decreased to 20 mg/dl, but he gained weight. Further adjustment of his diet, diuretics, and potassium supplementation produced diuresis, but once again the BUN increased from 20 to 60 mg/dl, while creatinine remained normal. He continued on captopril and isosorbide dinitrate was added, but renal insufficiency progressed to a BUN of 118 mg/dl and creatinine of 3.3 mg/dl. The Figure shows his subsequent response to alterations in captopril and diuretics. It can be seen that the BUN and creatinine decreased slightly with cessation of captopril, and further improved when hydrochlorothiazide was stopped. Large doses of potassium chloride were required to maintain his serum potassium, but when captopril

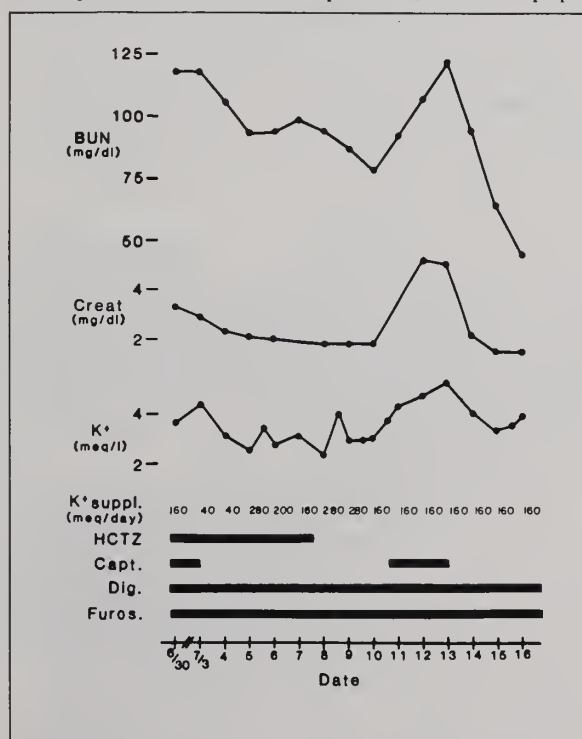


Figure — Response of a patient (Case #1) with severe congestive heart failure to alterations in captopril and diuretic therapy.

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was restarted the potassium rose dramatically as the BUN and creatinine increased. Cessation of captopril again resulted in improved renal function with a decrease in BUN, decrease in creatinine, and decrease in serum potassium. During this period his systolic blood pressure ranged from 96 to 104 mm Hg while taking captopril and 90 to 124 mm Hg without captopril. Continued severe refractory CHF subsequently led to cardiac transplantation with a fatal outcome.

Case 2

A 71-year-old white male had progressive symptoms of CHF following his second myocardial infarction in 1979. By March 1980 he was dyspneic at rest and had pedal edema despite therapy with digitalis and furosemide. Hydralazine and isosorbide dinitrate produced a transitory improvement, but he again became symptomatic with minimal activity and was admitted to the hospital. Vasodilators were stopped and his response to captopril was assessed 72 hours later. Initially captopril decreased his blood pressure from 110/40 to 76/30 mm Hg, right atrial pressure decreased from 7 to 3 mm Hg, and pulmonary artery wedge pressure decreased from 24 to 9 mm Hg, while cardiac output was increased from 2.6 to 3.3 L/min. Because of this initial beneficial response to captopril, the patient was started on 12.5 mg q8h of captopril and subsequently increased to 50 mg t.i.d. With the increasing dose of captopril, however, the patient's BUN increased from the mid 50s to the high 70s (mg/dl), while the creatinine stayed at 2.0 mg/dl. Concomitantly the patient became hyponatremic and hyperkalemic. The dose of captopril was reduced to the initial starting level of 12.5 q8h and the patient's fluid intake was liberalized while his diuretic therapy was reduced. These measures resulted in stabilization of the patient's condition, no further deterioration in the patient's renal function studies, and normalization of serum electrolytes. The patient was discharged on 12.5 mg of captopril q8h. He did well for several months, but subsequently presented to a local hospital in intractable failure from which he died shortly after admission.

Case 3

A 67-year-old white woman with rheumatic heart disease was referred in January 1981 for refractory CHF. Her history includes aortic valve replacement in 1973. In May 1980 symptoms of dyspnea on exertion and paroxysmal nocturnal dyspnea associated with severe mitral regurgitation and an ejection fraction of 45% by angiography led to mitral valve replacement. Failure to improve post-operatively despite therapy with digitalis, 125 mg qd, isosorbide dinitrate 30 mg q6h, prazosin 8 mg t.i.d., furosemide 160 mg intravenously b.i.d., acetazolamide 250 mg q.i.d., aldactone 25 mg q.i.d., and nasal oxygen, led to her referral.

On admission she had jugular venous distention to the earlobes while sitting upright, bibasilar rales, a pronounced, laterally displaced PMI, grade II/VI systolic ejection murmur, ascites, and pitting edema in the lower extremities. Electrocardiogram revealed atrial fibrillation with left bundle branch block. The chest Xray showed cardiomegaly, bilateral pleural effusions, and increased pulmonary vasculature with cephalization. Ejection fraction by gated blood pool scan was 15%. There was no evidence on examination or echocardiogram of prosthetic valve dysfunction. Her BUN was 24 mg/dl and creatinine 1.2 mg/dl.

The patient was maintained on digoxin, spironolactone, and furosemide, as well as a restricted sodium diet. She diuresed and her weight dropped 2 kg after several days of hospitalization. Captopril therapy was then initiated at 25 mg q8h, and then increased to 50 mg q8h two days later. Although a fall in mean blood pressure from 73 to 60 mm Hg occurred with initiation of captopril therapy, the drug was otherwise well tolerated. She continued to diurese and her weight dropped another 1.5 kg. Despite clinical improvement her BUN increased to 69 mg/dl while her creatinine remained at 1.2 mg/dl. Subsequently her BUN increased to a maximum of 103 mg/dl and the creatinine increased to 2.2 mg/dl. Serum potassium increased to a maximum of 6.2 mg/dl. The captopril dosage was therefore reduced to 25 mg q8h, all diuretics were stopped, and salt and fluid restrictions were liberalized. These measures resulted in a decrease

in BUN to 28 mg/dl and creatinine to 1.1 mg/dl with normalization of serum potassium. Her medications on discharge were digoxin 0.125 mg daily, furosemide 20 mg daily, and captopril 25 mg q8h.

Discussion

These three case reports document exacerbation of azotemia occurring with use of captopril to treat CHF. The increases in BUN occurred without exacerbations of symptoms of CHF or evidence of clinical deterioration. The increases in serum potassium that accompanied the azotemia could have lead to serious problems had therapy remained unaltered.

The renal responses of our patients were inconsistent with the findings of Dzau, et al.⁶ They reported improved para-amino hippurate and/or creatinine clearance with a decrease in BUN and creatinine in six patients with severe CHF treated with captopril. In contrast, Sharpe, et al.⁷ noted no change in serum creatinine or in protein excretion in 11 NYHA class III or IV patients receiving chronic captopril.

The mechanism by which captopril produced azotemia in these patients is not readily apparent. The previous suggestion by Pierpont, et al.⁸ that patients in whom blood pressure falls to lower levels during captopril are more likely to have adverse renal effects may have been applicable to the second two of these three patients. In addition, it has been previously well recognized that potent diuretics can produce or exacerbate azotemia in patients with CHF. All three of these patients were receiving diuretics, and even though they were not clinically hypovolemic, the diuretics (as well as fluid and salt intake) probably affected their renal function along with the captopril. It may be postulated that a captopril induced decrease in angiotensin could preferentially dilate post-glomerular efferent arterioles. This could result in a decreased glomerular filtration rate despite an increase in renal blood flow because of a lower filtration fraction.

Serum potassium increased in all three of our patients as the azotemia progressed. Consistent with our findings, Maslowski, et al.⁹ reported potassium retention in five patients during four days of captopril, and this occurred concomitant with clinical and hemodynamic improvement. The potassium retention may reflect a decrease in renal blood flow, but it is also possible that changes in aldosterone secretion may be important. Captopril induced decreases in angiotensin II would decrease aldosterone secretion, thus promoting natriuresis and potassium retention. This mechanism was demonstrated in hypertensive patients given captopril,¹² and thus could occur in patients with CHF. Prudent use of angiotensin-converting enzyme inhibitors can be potentially beneficial for patients with severe refractory CHF. However, serum electrolytes

and laboratory evidence of renal dysfunction must be monitored in patients with CHF who are treated with captopril.

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A Comparison of Thallium-201 Myocardial Imaging with Exercise-ECG and Coronary Angiography in 28 Patients with Suspected Ischemic Heart Disease

LEE A FORSTROM, M.D.,* ANTHONY M. COOK, M.D.,† JEFFREY S. SCHWARTZ, M.D.,‡
and MERLE K. LOKEN, M.D., Ph.D.#

Thallium-201 scintigraphy was compared with the results of exercise-ECG testing and coronary angiography in 28 patients with suspected ischemic heart disease. Myocardial imaging was performed following maximal treadmill exercise and four hours later at rest, by means of a standard scintillation camera. The imaging studies, performed over a period of two and one-half years, were reinterpreted in a blinded manner by three independent nuclear physicians. Images were interpreted without computer processing. Results were compared with the original readings, and with exercise-ECG and angiographic findings. On blinded reinterpretation, thallium-201 images showed a mean sensitivity of 91% and specificity of 69% in the detection of significant coronary artery disease. These values compared very favorably with the results of exercise-ECG testing. There was good inter- and intra-observer agreement in image interpretation. These results support the clinical usefulness of thallium-201 scintigraphy using standard imaging techniques as a non-invasive test for ischemic heart disease.

THALLIUM-201 MYOCARDIAL imaging is now widely accepted as a useful diagnostic procedure in the evaluation of patients with suspected ischemic heart disease. Studies from various centers have reported values for the diagnostic sensitivity of this test ranging from 68%¹ to 95%,² with specificity ranging from 50%³ to 100%.^{1,4-7} It is generally agreed that such studies are most informative when comparison is made between images obtained immediately following injection of thallium-201 during maximal stress and subsequent images obtained several hours later with the patient at rest. During this interval, redistribution of the thallium-201 radioactivity occurs, with relative normalization of uptake in myocardial regions rendered ischemic during exercise.⁸ Contrariwise, defects in myocardial uptake seen on both stress and resting images most often represent sites of myocardial infarction, which may be either old or acute.⁸ Analyses of the diagnostic efficacy of this test indicate that it is

clinically most useful in patients with a low to moderate pre-test probability of ischemic heart disease.⁹

In this communication, we report on our experience with exercise and rest thallium-201 imaging in 28 patients who also underwent exercise-ECG testing and coronary arteriography. These studies were performed at the University of Minnesota Hospitals between July, 1977 and December, 1980.

Methods

The study population consisted of 28 patients with

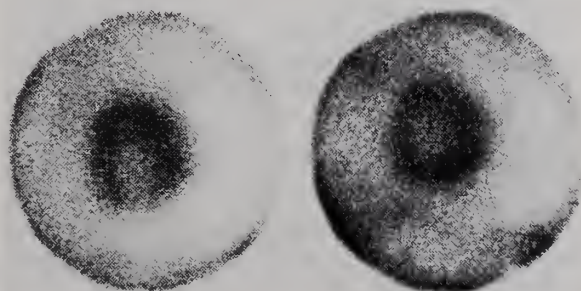


Figure 1 — Thallium-201 images (LAO view) in a 50-year-old patient with exertional dyspnea and LBBB on EKG. Image following stress (left) showed an apical defect which improved on delayed image (right), consistent with myocardial ischemia. Coronary angiogram showed diffuse disease.

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suspected ischemic heart disease, including 21 males and 7 females. Age of the patients ranged from 14 to 69 years. The youngest patient had congenital stenosis of the LAD coronary artery. All other patients had suspected arteriosclerotic coronary artery disease. Patient consent was obtained in all cases.

Thallium-201 imaging was performed in conjunction with exercise ECG procedures. Graded exercise testing on a treadmill was performed following the standard Bruce protocol. Thallium-201 in a dose of 1-2 millicuries was injected intravenously at a time approaching maximum stress, usually at least one-half minute before termination of exercise. After post-exercise ECG tracings were completed, myocardial imaging was performed by means of a scintillation camera with window settings to encompass the two major photon peaks of thallium-201. Imaging was begun within 10 minutes of cessation of exercise. Views were taken in the anterior, left anterior oblique and left lateral projections. Approximately 300,000 counts were obtained for each image. The imaging procedure was repeated about four hours later, with the patient in a resting state.

Exercise was performed to a symptom limited maximum. Reasons for termination of exercise included angina, serious arrhythmia, breathlessness or fatigue. Exercise ECGs were interpreted as positive if there was \geq one millimeter horizontal or down-sloping ST segment depression.

Thallium-201 images were initially interpreted in a routine manner by a trained nuclear medicine physician. For purposes of this review, all 28 patient studies were subsequently reinterpreted in a blinded

manner by three experienced nuclear physicians. These readings were then compared with each other, with the original interpretations, and with exercise-ECG and angiographic findings.

Coronary angiography was performed by the standard Judkins technique. The official hospital reports of angiographic findings were used for the purposes of the study. Angiographic results were considered positive for significant coronary artery disease in the presence of $\geq 70\%$ stenosis of at least one major coronary artery.

Thallium-201 images and exercise-ECG tests were correlated with angiographic findings on a "global" basis, in which results were compared without regard to anatomic sites of involvement.

Results

Patients were divided into two groups based on the findings of coronary angiography. Group A consisted of patients with severe coronary artery disease ($\geq 70\%$ stenosis of at least one coronary artery). Group B consisted of patients whose coronary arteries were either normal or showed less severe changes.

Group A

This group included 12 patients with severe coronary artery disease. Results of thallium-201 myocardial imaging and exercise-ECG testing in this group are summarized in Table 1.

On blinded reinterpretation, thallium-201 images were read as positive for ischemia in 12, 11 and 10 of these cases, respectively, by the three observers. This represents a mean test sensitivity of 91%.

TABLE 1
Thallium-201 Imaging — Summary of Results in Patients with
Significant Coronary Artery Disease*

Patient	Original		Reinterpretation		
	Interpretation	OBS. 1	OBS. 2	OBS. 3	GXT**
1. (LAD-90%, R-50%)	+	+	+	+	+
2. (LAD-70%, R-100%)	—	+	—	+	U(SME)
3. (LAD-70%, R-70%, C-100%)	+	+	+	+	+/-
4. (LAD-75%, R-90%, OM-90%)	+	+	+	—	+
5. (LAD-100%, R-90%, C-50%, CM-70%)	+	+	+	—	+
6. (LAD-100%)	+	+	+	+	—
7. (LAD-40%, R-100%)	+	+	+	+	+/-
8. (LAD-80%, R-95%, C-90%)	+	+	+	+	+
9. (SP 2-vessel CAB)	+	+	+	+	+/-
10. (LAD-99%, C-70%)	—	+	+	+	+
11. (LAD-50%, C-50%, R-100%)	+	+	+	+	U(LBBB)
12. (LAD-100%)	+	+	+	+	+
Total (+)	10	12	11	10	6
Sensitivity	83%	100%	91%	83%	60%

*70% stenosis in at least one coronary artery by angiography

**Graded Exercise-ECG Test

U = Unsatisfactory

SME = Submaximal Exercise

LBBB = Left Bundle Branch Block

In 10 of these cases, the original interpretation had been provided by one of the same observers. In eight of these 10 cases, the original interpretation was also positive. In the two remaining cases, the study was originally interpreted as positive by another observer. Ten of the 12 studies were thus originally read as abnormal, for a test sensitivity of 83%.

Graded exercise-ECG testing was carried out on all of these patients. However, the exercise-ECG results were considered unsatisfactory in two patients, in one case due to left bundle branch block and in another because only sub-maximal exercise was achieved. In the remaining 10 patients, exercise-ECG was considered definitely positive in six, for a test sensitivity in this subgroup of 60%.

An example of an abnormal thallium-201 study showing a perfusion defect with exercise which "fills in" on subsequent resting images, consistent with a region of reversible myocardial ischemia, is shown in Figure 1. Figure 2 illustrates a study showing a fixed perfusion defect, present on both stress and resting images, consistent with myocardial infarction.

Group B

There were 16 patients without significant coronary artery disease. Results of thallium-201 imaging and exercise-ECG testing in this group are summarized in Table 2.

On blinded reinterpretation of thallium-201 images, the three observers judged these studies normal in nine,

12 and 12 cases, respectively, for a mean specificity of 69%.

Of the 14 studies originally interpreted by one of the same three observers, eight had been read as normal. The two remaining cases had both been reported as normal by another observer. Ten of the 16 studies had thus been originally interpreted as normal, for a mean specificity of approximately 63%.

False positive readings tended to cluster in the same patients, with regard both to original interpretation and reinterpretation of the images. On blinded reinterpretation, for example, all false positive readings occurred in a sub-group of six patients. In two of these, all three observers interpreted the images as abnormal. These studies had also been initially reported as abnormal. In

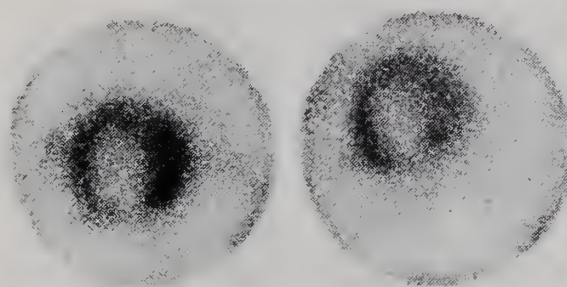


Figure 2 — Thallium-201 images (LAO view) in a 45-year-old patient with hyperlipidemia and previous MI. An apical defect is seen in both stress (left) and rest (right) images, consistent with myocardial scar. Coronary angiogram showed occlusion of the LAD coronary artery.

TABLE 2
Thallium-201 Imaging — Summary of Results in Patients Without
Significant Coronary Artery Disease

Patient	Original Interpretation	Reinterpretation			GXT* U(SME)
		OBS. 1	OBS. 2	OBS. 3	
1.	+	+	+	+	U(SME)
2.	—	—	—	—	+
3.	+	+	—	—	U(LBBB)
4.	—	—	—	—	—
5.	+	—	—	—	+/-
6.	—	—	—	—	—
7.	—	—	—	—	+
8.	—	+	—	—	U(LVH)
9. (LAD-50%)	—	+	—	+	+
10.	+	+	+	+	+
11. (LAD-50%)	—	—	—	—	U(SME)
12. (LAD-50%)	—	—	—	—	+
13. (LAD-30%)	—	—	—	—	+
14.	—	—	—	—	U(LVH)
15.	+	+	+	—	U(SME)
16.	+	+	+	+	U(SME)
Total (—)	10	9	12	12	2
Specificity	63%	56%	75%	75%	22%

*Graded Exercise-ECG Test

U = Unsatisfactory Test

SME = Submaximal Exercise

LBBB = Left Bundle Branch Block

LVH = Left Ventricular Hypertrophy

one of these patients, there was some disagreement at angiography over a possible stenosis at the origin of the left anterior descending coronary artery. Exercise-ECG testing was unsatisfactory in both patients due to submaximal exercise level achieved.

In this group of 16 patients, exercise-ECG testing was considered unsatisfactory in seven patients, either because of resting electrocardiographic abnormalities which confused their interpretation, or because of submaximal exercise level achieved. In the remaining nine cases, the exercise-ECG was interpreted as positive in six, equivocal in one, and negative in only two patients. The specificity of exercise-ECG testing in this subgroup (where the test was considered adequate) was thus very low, at approximately 22%.

Observer Variability

Inter-observer variability was analyzed for the three observers on blinded reinterpretation of the images. In angiographically positive cases (12 patients), there was three observer agreement in nine instances, and "consensus" (at least two observer) agreement that the study was abnormal in all 12 cases.

In the 16 patients without significant coronary artery disease, there was three observer agreement in nine instances. In 11 cases, at least two observers agreed that the study was normal.

There were a total of 23 cases in which images had been originally read and subsequently reinterpreted by the same observer. There was agreement between these readings in 20 of the 23 cases (87%).

These results are summarized in Table 3.

Discussion

Although thallium-201 myocardial imaging is now a

well established procedure in the evaluation of patients with suspected ischemic heart disease, various reports indicate that several factors may condition the diagnostic usefulness of this test. For example, it is generally agreed that the test is most sensitive in detecting myocardial ischemia when comparison is made between images obtained following maximal stress and those obtained several hours later with the patient in a resting state. Defects in myocardial uptake which are present on images following stress, but which partially or completely fill in on resting images, are generally taken to represent zones of reversible ischemia, while persistent defects more likely represent myocardial infarction. This concept has been generally borne out in our experience, in which four of five patients with fixed defects on thallium-201 images also had ECG evidence of old myocardial infarction. In five additional patients with only partially reversible defects, two had ECG changes of probable old myocardial infarction. In three other patients with ECG evidence of old infarction, two had reversible defects on thallium-201 images, while in the third patient both imaging studies and coronary angiography were normal.

It has been shown that redistribution of thallium-201 activity into myocardial regions rendered ischemic by stress may begin soon after cessation of exercise.^{10,11} In order to maximize the sensitivity of the test, therefore, it is important that image acquisition be initiated as soon as possible after exercise is stopped. It is also important for test sensitivity that an adequate exercise level should be achieved.¹²

In the present series, the exercise level obtained was considered inadequate in only one of the patients with angiographically proved disease. In this patient, the original interpretation and one reinterpretation of the thallium-201 images were false negatives.

In the present study, exercise-ECG testing was considerably inferior to thallium-201 imaging in the detection of significant coronary artery disease. This may in part reflect a bias in the selection of patients, inasmuch as patients with unsatisfactory or equivocal exercise-ECG test results were more likely than others to be referred for thallium-201 imaging. However, other authors have reported superior diagnostic accuracy for thallium-201 imaging as compared with exercise-ECG testing.^{5,7,13,14}

Using the values for sensitivity and specificity obtained with blinded reinterpretation of thallium-201 images in this study, pre- and post-test probability curves, and a curve representing post-test probability differences, are illustrated in Figure 3. These curves are plotted from disease probabilities calculated from

TABLE 3

Thallium-201 Imaging — Observer Variability

<u>Inter-observer Variability</u>	
<u>Positives (12 cases)</u>	
3 observer agreement	= 9/12 (75%)
2 and/or 3 observer agreement	= 12/12 (100%)
<u>Negatives (16 cases)</u>	
3 observer agreement	= 9/16 (56%)
2 and/or 3 observer agreement	= 11/16 (69%)
<u>Totals</u>	
3 observer agreement on correct interpretation	= 18/28 (64%)
2 and/or 3 observer agreement on correct interpretation	= 23/28 (82%)
<u>Intra-observer Variability</u>	
<u>Positives (10 cases)</u>	
Same observer agreement	= 8/10 (80%)
<u>Negatives (13 cases)</u>	
Same observer agreement	= 12/13 (92%)
<u>Totals</u>	
Same observer agreement	= 20/23 (87%)

standard Bayesian equations.⁹ The test has its greatest diagnostic value where the curve representing post-test probability difference is highest. On our results, this would be in patients having an intermediate (~0.6) pre-test probability of coronary artery disease. These results are generally comparable to those reported by others, although the sensitivity values reported here may be somewhat higher than most, while the specificity may be somewhat lower. This might be seen as a tendency to "over call" possible abnormalities on the images. We believe, however, that this tendency is appropriate in the use of a non-invasive screening test of this kind, where the risk of a missed diagnosis is likely to outweigh the risk of a potentially negative invasive study.

It should be noted that our studies were carried out with standard scintillation cameras of a type found in nearly every nuclear medicine clinic, and were interpreted without the benefit of computer processing. Improvements in the diagnostic accuracy of thallium-201 imaging have been reported by several investigators using various refinements in imaging technique, including computer processing and quantitative analy-

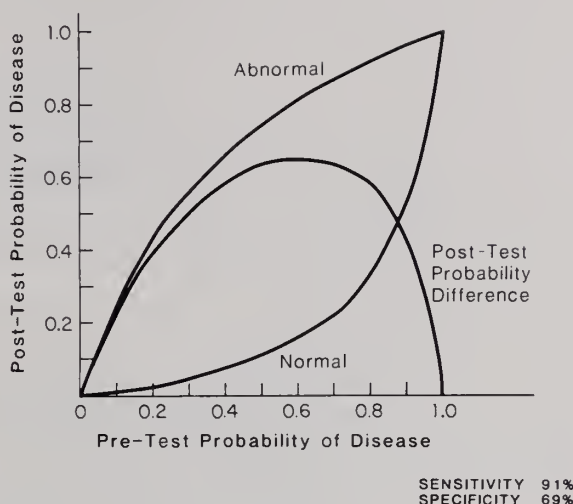


Figure 3

sis of the images, and tomographic imaging methods. While such developments will no doubt continue to occur, our results indicate that this test may play a useful role in the diagnosis of ischemic heart disease even in community hospitals where only conventional nuclear medicine imaging facilities are available.

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Study on Migraines in Children

Drs. Karen Olness and John MacDonald are conducting a study on migraines in children. The study will last nine months per patient and may include drug therapy and relaxation and biofeedback exercises at no cost to the patient. The children must be between six to 13 years, of either sex, with a history of severe headaches over a four-month period, have an IQ greater than 70 by WISC Form R and have a normal neurological exam by a pediatrics neurologist at the beginning and end of the study. Excluded from the study will be children who have had prior experience with self hypnosis and those with a history of asthma, diabetes mellitus, or known hypoglycemia. If you know of a patient who would benefit from this research, please call Dr. MacDonald at 588-0661.

Biosynthetic Human Insulin Study

Eli Lilly and Company is sponsoring a two-year study of Biosynthetic Human Insulin (BHI) at the St. Louis Park Medical Center, Minneapolis, MN. Donnell Etzwiler, M.D. is the Principal Investigator.

The double-blind study will furnish further data on the efficacy of BHI which recently was approved by the FDA.

Those eligible for enrollment in the evaluation are non-pregnant individuals over the age of six years who:

1. Require insulin for control of diabetes.
2. Have never previously received insulin.
3. Have no evidence of severe cardiovascular or renal disease.
4. Have no history of cancer.
5. Are willing and capable of complying with the study protocol.
6. Are likely to remain within commuting distance of Twin Cities for the two-year duration of the study.

Physicians interested in enrolling patients in the study may obtain further information by contacting Dr. Etzwiler or LeAnn McNeil, R.N., M.S., Project Director, at (612) 927-3393.

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Drug Profiles

Warfarin

Pharmacokinetics and Use in the Elderly

VIRGIL C. DIAS B.A., B.S.*

DEEP VEIN THROMBOSIS, transient ischemic attacks, pulmonary embolism, mitral valve disease with atrial fibrillation, and arterial embolization secondary to prosthetic cardiac valve replacement are diseases frequently seen in the elderly. Warfarin is the drug of choice and is widely used when oral anticoagulant therapy is required in these disease states. The kinetics of warfarin with particular attention to the elderly is presented below.

Absorption

Absorption of warfarin is rapid and complete in the stomach and upper G.I. tract, reaching a peak plasma concentration in three to nine hours.¹ The therapeutic concentration in thromboembolic disease is 1-4 mg/l. Inhibition of absorption may occur with cholestyramine² and colestipol. Absorption is minimally inhibited, if at all, with psyllium (Metamucil) or mineral oil. Antacids, laxatives and anticholinergics have not in practice altered warfarin absorption.

Distribution

Warfarin ($pK_a = 4.8$) is highly protein bound (98.5%), virtually all to albumin, and is therefore primarily distributed to the albumin space with an apparent volume of distribution (V_d) of 7.7 liters or 20% of body weight.³ In renal dysfunction and uremia warfarin binding is reduced, resulting in increased clearances.^{4,5} In liver disease V_d of the drug is unchanged.

Metabolism

Warfarin is almost completely metabolised in the liver by the microsomal mixed function oxidase system. The hepatic extraction ratio is low (< 0.3) and therefore drug metabolism is not affected by changes in hepatic flow, e.g. CHF. Plasma clearance is 3.8 ml/hr/kg⁶, and it appears to remain unchanged in liver disease, thyrotoxicosis and hypothyroidism. Increased warfarin sensitivity in liver disease and hyperthyroidism is a result of reduced clotting factor synthesis and increased clotting factor degradation,

respectively.

Renal Elimination

Fraction of warfarin excreted unchanged is less than 1%. Other than a decrease of binding in renal dysfunction or in uremia, renal elimination plays no significant part in warfarin kinetics.

Half Life

The plasma half life is 44 hours and is not dose dependent.

Contraindications/Interactions

Warfarin is contraindicated in patients with the following: coagulation factor deficiencies, thrombocytopenia, recent cerebrovascular hemorrhage, recent CNS or eye surgery, identifiable sources of bleeding (GI, GU, pulmonary) malignant or severe hypertension, T-tube drainage of stomach or small intestines, severe malabsorptive disease. There are many drugs that interact with warfarin⁷; however, there are no absolute contraindications for their use; careful monitoring of the prothrombin time (PT) and possible dosage adjustment is recommended.

The following is a list of commonly used drugs in the elderly that interact with warfarin: drugs that enhance anticoagulation effects: allopurinol, aminoglycoside antibiotics (in patients with low dietary vitamin K intake), cephalosporins (in patients NPO for greater than 7-10 days or having a low vitamin K intake and serious multisystem disease), chloral hydrate, cimetidine, indomethacin, quinidine, salicyclates (in large doses), sulindac, trimethoprim/sulfamethoxazole. Drugs that alternate anticoagulation effects: barbiturates, cholestyramine, colistepol, glutethimide, griseofulvin.

Dosage Considerations

Treatment is generally started with a 10 mg dose (2-5 mgs in the very elderly) once daily for three to four days, after which, depending upon the PT, a maintenance dose of 1 to 20 mg may be given. A loading dose is unnecessary since there is no change in activity of factors II, IX, and X, following a loading

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dose,⁸ on the contrary, severe factor VII deficiency may result, leading to serious bleeding. In addition, the finding of an appropriate maintenance dose may be delayed. Antithrombotic effects of warfarin occur in three to four days from the start of dosing.

Elderly patients (> 60 yrs old) who are recovering from cardiac valve replacement surgery should be started on a dose of no more than 5 mg of warfarin for three to four days, particularly if cefamandole is used as the surgical prophylactic antibiotic.⁹ Dietary vitamin K intake and body vitamin K stores may also affect warfarin dosing.

Clinical Comments

Warfarin inhibits the synthesis of vitamin K dependent clotting factors VII, IX, X and II. Prothrombin time, which measures factor II, VII and X is used to regulate the warfarin dose. PT is kept between 1½ to 2½ that of the control value to ensure adequate anticoagulation. The anticoagulant response is pronounced in the elderly due to an increased intrinsic sensitivity to the drug. In the elderly the PT should be monitored daily in hospital and one to four

weeks on an outpatient-basis, during anticoagulant therapy.

Adverse Reactions

The most serious is hemorrhage,¹⁰ frequently manifested as asymptomatic hematuria, GI bleeding and epistaxis. Hemoptysis and bleeding in the conjunctiva and gums is less common. Serious bleeding may occur at any site, and the chances of hemorrhage increases dramatically as the PT rises in excess of 2½ that of the control value. Infrequent side effects include nausea, vomiting, diarrhea, urticaria alopecia, purple toes and skin necrosis.

Management of Bleeding

For mild bleeding warfarin may be stopped for 24 to 72 hrs. In serious bleeding warfarin is discontinued and fresh frozen plasma is given to restore clotting factors immediately, followed by vitamin K (phytonadione) 10-30 mg IV. If warfarin therapy is to be restarted, resistance to warfarin may be present for an unknown length of time following a vitamin K dose.

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News conference on March 3, 1983, to release the results of the study: "Medical Practice in Minnesota: Physician Perceptions of Medical Manpower, Competition and Other Public Policy Issues." Participants in the conference (from left to right) were: Vernon L. Sommerdorf, M.D., Gunard A. Nelson, M.D., Gordon S. Landsman, M.D., Chair-MMA Committee on Long Range Planning, and Severin H. Koop, M.D., President. (Photo by Roger Johnson.)

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(BRIEF SUMMARY)

DESCRIPTION: Each tablet contains 200 mg meprobamate and 325 mg aspirin.

INDICATIONS: Adjunct in short-term treatment of pain accompanied by tension and/or anxiety in patients with musculoskeletal disease. Clinical trials demonstrated in these situations relief of pain is somewhat greater than with aspirin alone. Effectiveness in long-term use, i.e., over 4 months, has not been assessed by systematic clinical studies. Physicians should periodically reassess usefulness of drug for individual patients.

CONTRAINDICATIONS: ASPIRIN: Allergic or idiosyncratic reactions to aspirin or related compounds. MEPROBAMATE: Acute intermittent porphyria, allergic or idiosyncratic reactions to meprobamate or related compounds, e.g., carisoprodol, meprobamate, or carbomal.

WARNINGS: ASPIRIN: Use salicylates with extreme caution in patients with peptic ulcer, asthma, coagulation abnormalities, hypoprothrombinemia, vitamin K deficiency, or those on anticoagulants. In rare instances, aspirin in persons allergic to salicylates may result in life-threatening allergic episodes. MEPROBAMATE: DRUG DEPENDENCE: Physical and psychological dependence, and abuse have occurred. Chronic intoxication from prolonged ingestion of, usually, greater than recommended doses is manifested by ataxia, slurred speech, and vertigo. Therefore, carefully supervise dose and amounts prescribed and avoid prolonged use, especially in alcoholics and others with known propensity for taking excessive quantities of drugs. Sudden withdrawal after prolonged and excessive use may precipitate recurrence of preexisting symptoms, e.g., anxiety, anorexia, or insomnia, or withdrawal reactions, e.g., vomiting, ataxia, tremors, muscle twitching, confusional states, hallucinations, and, rarely, convulsive seizures. Such seizures are more likely in persons with CNS damage or preexistent or latent convulsive disorders. Onset of withdrawal symptoms occurs usually within 12 to 48 hours after discontinuation; symptoms usually cease

within next 12- to 48-hour period. When excessive dosage has continued for weeks or months, reduce dosage gradually over 1 to 2 weeks rather than stop abruptly. Alternatively, a short-acting barbiturate may be substituted, then gradually withdrawn.

POTENTIALLY HAZARDOUS TASKS: Warn patients meprobamate may impair mental or physical activities required for potentially hazardous tasks, e.g., driving or operating machinery.

ADDITIONAL EFFECTS: Since CNS-suppressant effects of meprobamate and alcohol or meprobamate and other psychotropic drugs may be additive, exercise caution with patients taking more than one of these agents simultaneously.

USAGE IN PREGNANCY AND LACTATION: An increased risk of congenital malformations associated with minor tranquilizers (meprobamate, chloralhydrate, and diazepam) during first trimester of pregnancy, has been suggested in several studies. Because use of these drugs is rarely a matter of urgency, their use during this period should almost always be avoided. The possibility that a woman of child-bearing potential may be pregnant at time of institution of therapy should be considered. Advise patients if they become pregnant during therapy or intend to become pregnant to communicate with their physicians about desirability of discontinuing the drug.

Meprobamate passes the placental barrier. It is present both in umbilical cord blood at or near maternal plasma levels and in breast milk at lactating mothers at concentrations two to four times that of maternal plasma. When use of meprobamate is contemplated in breastfeeding patients, consider the drug's higher concentrations in breast milk as compared to maternal plasma levels.

USAGE IN CHILDREN: Keep preparations with aspirin out of reach of children. Equagesic-M is not recommended for patients 16 years of age and under.

PRECAUTIONS: ASPIRIN: Salicylates an-

tagonize uncoupling activity of probenecid and sulfinpyrazone. Salicylates are reported to enhance hypoglycemic effect of sulfonylurea antidiabetics. MEPROBAMATE: Use lowest effective dose, particularly in elderly and/or debilitated, to preclude over-sedation. Meprobamate is metabolized in the liver and excreted by the kidney; to avoid excess accumulation exercise caution in its use in patients with compromised liver or kidney function. Meprobamate occasionally may precipitate seizures in epileptic patients. It should be prescribed cautiously and in small quantities to patients with suicidal tendencies.

ADVERSE REACTIONS: ASPIRIN: May cause epigastric discomfort, nausea and vomiting. Hypersensitivity reactions, including urticaria, angioneurotic edema, purpura, asthma, and anaphylaxis may rarely occur. Patients receiving large doses of salicylates may develop tinnitus.

MEPROBAMATE: CNS: Drowsiness, ataxia, dizziness, slurred speech, headache, vertigo, weakness, paresthesias, impairment of visual accommodation, euphoria, overstimulation, paradoxical excitement, fast EEG activity. GI: Nausea, vomiting, diarrhea.

CARDIOVASCULAR: Palpitation, tachycardia, various forms of arrhythmia; transient ECG changes, syncope, hypotensive crisis. **ALLERGIC OR IDIOSYNCRATIC:** Milder reactions are characterized by itchy, urticarial, or erythematous maculopapular rash, generalized or confined to the groin. Other reactions include leukopenia, acute nonthrombocytopenic purpura, ptelechiae, ecchymoses, eosinophilia, peripheral edema, adenopathy, fever, fixed drug eruption with cross-reactivity to carisoprodol, and cross-sensitivity between meprobamate, metoprolol, and meprobamate-carbomal. Rare, more severe hypersensitivity reactions include hyperpyrexia, chills, angioneurotic edema, bronchospasm, oliguria, and anuria. Also, anaphylaxis, exfoliative dermatitis, stomatitis, and proctitis. Stevens-Johnson syndrome and

bullous dermatitis have occurred. **HEMATOLOGIC (SEE ALSO "ALLERGIC OR IDIOSYNCRATIC"):** Agranulocytosis, aplastic anemia have been reported, although no causal relationship has been established, and thrombocytopenic purpura.

OTHER: Exacerbation of porphyric symptoms.

DOSEAGE AND ADMINISTRATION: Usual dose is one or two tablets, 3 to 4 times daily as needed for relief of pain when tension or anxiety is present. Not recommended for patients 12 years of age and under.

OVERDOSAGE: Treatment is essentially symptomatic and supportive. Any drug remaining in the stomach should be removed. Induction of vomiting or gastric lavage may be indicated. Activated charcoal may reduce absorption of both aspirin and meprobamate. Aspirin overdosage produces usual symptoms and signs of salicylate intoxication. Observation and treatment should include management of hyperthermia, specific parenteral electrolyte therapy for ketoacidosis and dehydration, watching for evidence of hemorrhagic manifestations due to hypoprothrombinemia which, if it occurs, usually requires whole-blood transfusions. Suicidal attempts with meprobamate have resulted in drowsiness, lethargy, stupor, ataxia, coma, shock, vasomotor and respiratory collapse.

Some suicidal attempts have been fatal. The following data, reported in the literature and from other sources, are not expected to correlate with each case (considering factors such as individual susceptibility and length of time from ingestion to treatment), but represent usual ranges reported. Acute simple overdose (meprobamate alone): Death has been reported with ingestion of as little as 12 gram meprobamate and survival with as much as 40 gram.

BLOOD LEVELS: 0.5-2.0 mg percent represents usual blood-level range after therapeutic doses. The level may occasionally be as high as 3.0 mg percent. 3-10 mg percent usually corresponds to

findings of mild to moderate symptom of overdosage, such as stupor or light coma.

10-20 mg percent usually corresponds to deeper coma, requiring more intensive treatment. Some fatalities occur.

At levels greater than 20 mg percent, more fatalities than survivals can be expected.

Acute combined overdose (meprobamate with other psychotropic drugs or alcohol): Since effects can be additive, history of ingestion of a low dose of meprobamate plus any of these compounds (or of a relatively low blood or tissue level) cannot be used as a prognostic indicator.

In cases of excessive doses, sleep ensues rapidly and blood pressure, pulse, and respiratory rates are reduced to basal levels. Any drug remaining in stomach should be removed and symptomatic treatment given. Should respiration of blood pressure become compromised, respiratory assistance, CNS stimulants, and pressor agents should be administered cautiously as indicated. Diuresis, osmotic (mannitol) diuresis, peritoneal dialysis, and hemodialysis have been used successfully in removing both aspirin and meprobamate. Alkalinization of the urine increases excretion of salicylates. Careful monitoring of urinary output is necessary, and caution should be taken to avoid overhydration. Relapse and death, after initial recovery have been attributed to incomplete gastric emptying and delayed absorption.

HOW SUPPLIED: Bottles of 50 scored tablets.

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Skin Problems in Athletics

BRUCE BART, M.D.*

THE SKIN IS THE largest organ of the human body and is uniquely suited to protect us from our environment. Under normal circumstances the skin serves as a protective barrier against trauma, chemicals, and infectious agents. The integrity of this organ is of great importance to the health and consequent performance of an athlete.

Physical Trauma

Healthy, intact skin is normally protective against mild trauma. This protection is enhanced by the combination of connective and fatty tissue which provide some absorption of energy. However, when energy levels exceed the tolerance levels of the body, injury occurs. Specific types of injuries that may occur to the skin include abrasions and lacerations.

Treatment

Abrasions or lacerations must be thoroughly cleaned to prevent the onset of infection and promote complete healing. First, any bleeding must be controlled by placing a dry, sterile pad over the area and applying direct pressure. Next, the wound must be thoroughly cleaned with warm water and disinfecting soap to remove all dirt and foreign particles. More severe wounds must be treated accordingly.

Prevention

These wounds may be prevented by: (1) Using proper equipment to protect areas subject to contact (for example, knee pads in volleyball and facemasks in ice hockey). (2) Maintaining protective equipment or fixed equipment such as fences, hockey boards, volleyball standards, and spectator seating; these should be smooth and covered with padding. (3) Inspecting playing areas frequently; hazards that may cause or add to the severity of injuries (rocks, glass, equipment, etc.) must be removed. (4) Covering bony areas (knees, elbows, hips) with petroleum jelly to reduce the friction caused by falling on these body parts.

Friction Injuries

Injuries to the skin, especially on the hands and feet

may occur due to repeated friction. This friction may result in blisters, calluses, and corns.

Blisters result from shearing forces rubbing on the top layer of skin. The result is an accumulation of fluid between the top layer of skin and the layer just below.

Calluses are thickened areas of skin, caused by abnormal pressures, usually found over a bony prominence. The thickened skin serves to protect the underlying tissues. Common areas of involvement are under the metatarsal bones at the ball of the foot, along the inside edge of the large toe, and on the hands. Calluses present a problem when the thickened skin becomes hardened. Under stress, this may crack or tear away from the area, resulting in pain and exposing the underlying tissues to infection.

Corns are localized calluses with a hard central core. Primarily, corns develop over bony prominences, especially on the toes and over the metatarsal bones at the ball of the foot, as a result of friction and intermittent pressure from footwear. The discomfort may be continuous; any pressure on the area may cause disabling pain.

Black heel, indicated by brownish or blue-black specks on the back or sides of an athlete's heel, may be common in sports requiring quick stops, changes in direction, or constant pounding on hard surfaces. These areas are actually small blood blisters resulting from shearing stresses on the heel. This problem does not require specific attention unless pain or disability ensue.

Treatment

Treatment of friction injuries varies according to the severity of the problem. If any of these problems are painful or restrict participation, the underlying cause must be corrected. In such cases, surgical management of an abnormality associated with their development may be required.

In the case of blisters, if the affected area remains small and closed and causes minimal discomfort, treatment is rarely required. However, the top layer of skin should be left intact and the area protected by a small doughnut or piece of felt to prevent rubbing or pressure.

Occasionally, an athlete will experience great

*Chief, Department of Dermatology, Hennepin County Medical Center, Minneapolis, Minnesota.

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distress due to a blister that is left unopened. In such cases, the blister may be carefully opened to relieve pressure caused by the build-up of fluid. A sterile instrument must be used to make a small incision at the edge of the blister. Sterile gauze pads are placed over and around the blister; gentle pressure is then applied over the blister forcing the fluid out of the small incision onto the sterile gauze; the top layer of skin should be left intact to protect the lower layer. Following application of antibiotic ointment, the area is finally covered by a sterile dressing.

Frequently, the top layer of blistered skin will be broken during activity. In this case, the exposed lower layer of skin must be cleaned thoroughly to prevent infection. This may require cutting along the edge of the top layer of skin. However, the top layer must not be totally removed. Following a thorough cleaning, the lower layer must be covered with an antibiotic ointment; the top layer of skin is then returned to cover the area, and the entire area covered with a sterile dressing. In addition, any blister must be protected from further trauma until healing is complete.

The initial treatment of calluses and corns focuses on maintaining softness and pliability of the skin layers. This may be accomplished by using salves and lotions applied to the skin surface. If the area becomes tender, or should excessive thickening occur, it may be necessary to trim away the skin. Initially, the athlete can control the callus formation by using a callus file to remove excess skin after showering or soaking the area to soften the skin.

If too much thickening has occurred, the skin may have to be cut away carefully. If a callus does crack or tear away, the area requires thorough cleaning and application of antibiotic coverings until healing is complete. Corns which cause constant pain and discomfort may also require surgical removal of the underlying bony protuberances associated with the problem.

Prevention

Prevention of friction injuries is dependent upon proper equipment and training, and an understanding of the relevant anatomy.

Equipment that can prevent these injuries specifically includes protection of the feet and hands. Proper footwear is a major factor relative to the development of these problems. Shoes must be fit properly to each individual foot; further they must be broken-in gradually and allow moisture to escape. Moisture-absorbing inner socks with soft outer socks also assist in prevention. Athletes must be cautioned to stop when they feel or notice "hot spots" on the skin that indicate potential blister formation. These areas can be treated

with ice and protected from further friction before they develop into blisters. Padding and protection should be provided for bony protuberance and other anatomical abnormalities of the foot and ankle. Since padding may not be totally effective in prevention, a physician must be consulted to determine the potential for correcting these factors.

Prevention of friction injuries to the hands is managed by wearing proper hand coverings in such activities as baseball, softball, and gymnastics.

Training programs must provide for gradual toughening of skin exposed to stresses. Analysis of individual athlete's performance may reveal faulty weight distribution, especially in the feet when running, or improper techniques of play with injury incidence.

Contact Dermatitis

Dermatitis is an inflammation of the skin depicted by redness, itching, and, possibly, heat and swelling. This condition may be caused by contact with a diverse range of substances or materials including acid or alkaline substances, adhesive tape, uniform fabrics, dyes and glues in shoes, soaps, perfumes, deodorants, plants, such as poison ivy, and certain medications.

Through careful history-taking relevant to the onset and progress of the symptoms, it may be possible to determine the cause of the dermatitis. Therefore, it is important to investigate recent exposures including foods, hobbies, use of new clothing, etc. In association with this, examination for the type and distribution of the dermatitis is essential. If the problem persists, a physician specializing in skin problems should be consulted.

Treatment for dermatitis includes the following: (1) Decrease exposure to, or remove, irritants; (2) Prevent use of abrasive soaps; (3) Lubricate the skin; (4) Provide protective creams or lotions; (5) Topical corticosteroid creams; (6) Systemic steroids or antibiotics, if necessary.

Skin Infections

The skin is subject to many different infectious agents, particularly if the integrity of the physical and chemical structure of this large organ is altered. Factors such as sweating, exposure to another infected person, or exposure to heat or cold, trauma, and chemicals increase the potential for infection.

Bacterial Infections

Bacterial infections, often caused by staphylococcus aureus, may occur where there has been any break in the skin. These infections are a common problem for sports participants wearing protective padding; development of such infections is facilitated by the

warm, moist areas under the pads. The best way to prevent infection is to clean the area completely with soap and water immediately after an injury has occurred.

Impetigo is a crusted, weeping, inflamed skin condition caused by staphylococcal or streptococcal bacteria. This infection is highly contagious and can be transmitted by direct contact or by contact with infected mats, equipment, or towels. Individuals with impetigo should not engage in contact sports and must use careful hygiene to protect others. Treatment includes scrubbing with antibacterial soaps, and topical and systemic antibiotics.

Boils are very painful infections of the hair follicles indicated by red nodules and pustules. Areas subject to sweating and friction are particularly susceptible to the development of boils. Other factors facilitating this problem are: oily skin, poor hygiene, and local skin trauma from friction of clothing.

The organisms contained within the boils may spread to other individuals. Therefore, careful hygiene including a daily change in personal towels and dressings, is essential. Painful boils may need to be surgically drained. Use of antibiotic treatment and careful hygiene must be incorporated in these cases. Unless approval is given by the attending physician, athletes with boils or impetigo should not be allowed to participate in contact sports.

Viral Infections

Fever blisters, or cold sores, caused by herpes simplex virus, are recurrent infections that commonly affect the face; however, they may develop on any skin surface. The herpes simplex infection may reside quietly in the body for years until it is activated by a stimulus such as sunburn, fever, depressed immune system, or irritation. Initially, the infection appears as a group of blisters which opens up and later forms a crusted surface.

There is no cure presently available to the public for herpes simplex. However, the area must be kept clean and dry to promote healing of the lesion. Contact with the infected area must be avoided until the crusted area is gone.

Warts are small tumors, caused by the papova-virus, that may appear anywhere on the skin surface. These may be spread by direct contact. Sometimes warts will disappear with no treatment. Treatment may include cryotherapy with liquid nitrogen or chemotherapy with salicylic acid.

Plantar warts develop on the sole of the foot. These may cause pain, especially if they are located on the heel or other weight-bearing areas of the foot. Commonly a callus area will develop over a plantar

wart which may further enhance the problem.

The spread of plantar warts may be limited by careful hygiene of the feet. Also, maintaining clean floors in gyms, shower rooms, and locker rooms may prevent their occurrence. Use of rubber sandals, or other footwear, in these areas should be promoted.

Molluscum contagiosum is a small smooth dome-shaped wart which may also spread by direct skin-to-skin contact. These may be treated with liquid nitrogen or curettage.

Fungus Infections

Athlete's foot (*tinea pedis*) is a troublesome infection that causes scaling, redness, and cracking of the skin surface of the feet. The problem is most common on or near the webs between the toes. Typically, occlusive footwear that predisposes sweating has been identified as a factor in the onset of this problem. In addition, heat, friction, and exposure to fungus materials on floors of locker and shower rooms contribute to the development of this infection.

This painful and disabling infection can be prevented by the following: keeping feet clean and dry, using powder to maintain dryness, wearing clean cotton socks daily, and wearing ventilated shoes. Treatment consists of all of the measures discussed previously, in addition to the use of antifungal medications.

Tinea cruris, "jock itch", is a fungus infection that affects the groin area. Commonly, this problem accompanies athlete's foot. This occurs because an athlete may put on his underwear before putting on his socks, thus spreading the fungus. Heat, friction, sweating, obesity, and chafing garments contribute to the onset and recurrence of this infection. Common symptoms of itching, blistering, and swelling may cause severe discomfort and even disability.

Usually this fungus will respond readily to the use of antifungal agents and powders, in combination with the wearing of loose garments. Antifungal agents include Desenex, Tinactin, Lotrimin, and Holotex creams and lotions. Suitable powders are Tinactin powder and Zeasorb powder.

Summary

The skin must be protected from injury, chemicals, and infections to maintain its integrity. Although most problems identified in this article are not life-threatening, any factors which interfere with normal skin function can cause significant disability to the athlete. Early recognition, treatment, and correction of underlying causes are important in maintaining healthy skin. Prevention, of these disorders, is a priority in the health care of the athlete.

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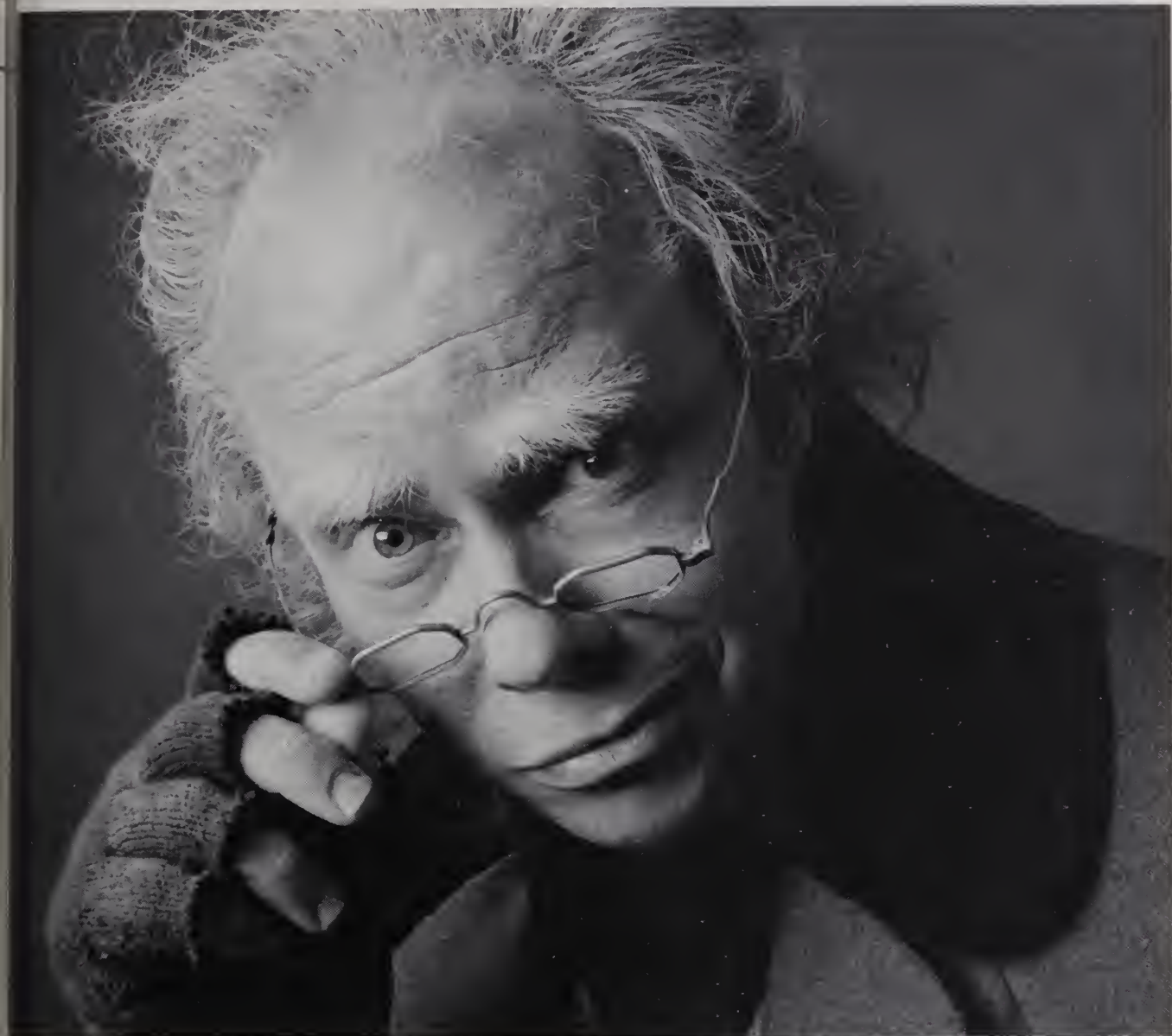
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Detection of the Alcoholic Patient in the Acute Care Setting

THOMAS G. BRIGGS, M.D.*; JULIE HUETTNER, R.D.H., B.S.,† and THE ALCOHOLISM TASK FORCE‡

A total of 1,004 patients in seven hospitals in the Minneapolis-St. Paul metropolitan area were screened for potential alcoholism. Approximately 3% of the population sample (30 patients) had previously been through an alcoholism treatment program. The Michigan Alcoholism Screening Test (MAST) was administered to 58% of the population sample to supplement information found on the medical record. Of the patients taking the MAST, 20% had a positive score (≥ 4), indicating potential for alcohol abuse. Nearly half (46%) of the patients with a positive MAST score did not have physician documentation of drinking history. Drinking history documentation by physicians was absent in 66% of the total population. Approximately 19% of the patients (including previous alcoholics) surfaced as having potential for alcohol abuse.

A DIAGNOSIS SCREEN for detection of alcoholism was applied concurrently to patients in seven general hospitals in the Minneapolis-St. Paul metropolitan area. The diagnosis screen included: (1) medical conditions, (2) abnormal laboratory tests, (3) a history of drinking problems, (4) medication patterns, and (5) other history of social or legal problems (Table 1). The Michigan Alcoholism Screening Test (MAST) was employed to supplement the information found in the medical record. Documentation of alcohol consumption and previous admissions or treatment for alcoholism were also observed.

The study was prompted by the growing concern for early detection of alcoholism in the hospital setting and the interest in physician practice patterns. Because there are no well-defined clinical criteria to substantiate the diagnosis of alcoholism, many physicians are reluctant to record the suspicion of alcoholism on a patient's medical record.¹ Hence, many patients with the potential for alcoholism, or those exhibiting the early stages of alcoholism, are not detected when the probability of successful intervention would be most beneficial.

Studies have shown that a diagnostic tool or

*Directs the chemical dependency treatment unit at St. John's Hospital in St. Paul, and is past Chairman of the Minnesota Medical Association's Committee on Chemical Dependency.

†Quality assurance specialist at the Foundation for Health Care Evaluation and an M.P.H. degree candidate in physiological hygiene at the University of Minnesota-School of Public Health.

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Timothy Magee, M.D.
Joyce Michaelson, R.N.
Julie Huettner (FHCE)
George Mann, M.D.

formula, when coupled with a test such as the MAST, shows a high degree of reliability in the early detection of alcoholics.^{2,3}

This paper presents the methods used and results obtained in detecting patients with the suspicion of alcoholism who are admitted to general hospital wards. The criteria used in the diagnosis screen were derived from the "Criteria for the Diagnosis of Alcoholism"

TABLE 1. Criteria for Detection of Alcoholism

CRITERION 1: DIAGNOSIS SCREEN																																							
<p>A. MEDICAL INDICATIONS:</p> <p>INSTRUCTIONS: Look through H&P, progress notes, nursing assessment, and nursing notes for statement of these conditions and circle any of those conditions found below in the chart.</p> <table border="0"> <tr> <td>1. GI Bleeding</td> <td>*20. Polyneuropathy</td> </tr> <tr> <td>2. Pneumonia</td> <td>21. Tuberculosis</td> </tr> <tr> <td>3. Hypertension (admit BP 180/90)</td> <td>22. Multiple Admissions</td> </tr> <tr> <td>4. Hepatomegaly</td> <td>**23. Fractures</td> </tr> <tr> <td>5. Cirrhosis</td> <td>24. Hemoptysis</td> </tr> <tr> <td>6. Malnutrition</td> <td>25. Aggressive Behavior</td> </tr> <tr> <td>7. Hematitis</td> <td>26. Absence from school or work</td> </tr> <tr> <td>8. Jaundice</td> <td>27. Personality Changes</td> </tr> <tr> <td>9. Ascites</td> <td>28. Multiple ecchymotic areas</td> </tr> <tr> <td>10. Gastritis</td> <td>29. Fatty infiltration of liver</td> </tr> <tr> <td>11. Trauma</td> <td>30. Memory loss (blackouts/amanesia)</td> </tr> <tr> <td>12. Hallucinations</td> <td>31. Tremors (unexplained)</td> </tr> <tr> <td>13. Seizures</td> <td>32. Social isolation</td> </tr> <tr> <td>14. Burns</td> <td>33. Any mental illness diagnosis</td> </tr> <tr> <td>15. Delirium/Tremors</td> <td>34. Increased or high tolerance to alcohol</td> </tr> <tr> <td>16. Pancreatitis</td> <td>35. History of suicide attempts</td> </tr> <tr> <td>17. Withdrawal (abstinence syndrome)</td> <td>*Polyneuropathy - look for numbness of hands and feet.</td> </tr> <tr> <td>18. Depression</td> <td>**Fractures - look for a history of multiple fractures of two or more.</td> </tr> <tr> <td>19. Macrocytosis without anemia</td> <td></td> </tr> </table>		1. GI Bleeding	*20. Polyneuropathy	2. Pneumonia	21. Tuberculosis	3. Hypertension (admit BP 180/90)	22. Multiple Admissions	4. Hepatomegaly	**23. Fractures	5. Cirrhosis	24. Hemoptysis	6. Malnutrition	25. Aggressive Behavior	7. Hematitis	26. Absence from school or work	8. Jaundice	27. Personality Changes	9. Ascites	28. Multiple ecchymotic areas	10. Gastritis	29. Fatty infiltration of liver	11. Trauma	30. Memory loss (blackouts/amanesia)	12. Hallucinations	31. Tremors (unexplained)	13. Seizures	32. Social isolation	14. Burns	33. Any mental illness diagnosis	15. Delirium/Tremors	34. Increased or high tolerance to alcohol	16. Pancreatitis	35. History of suicide attempts	17. Withdrawal (abstinence syndrome)	*Polyneuropathy - look for numbness of hands and feet.	18. Depression	**Fractures - look for a history of multiple fractures of two or more.	19. Macrocytosis without anemia	
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<p>B. LABORATORY TESTS:</p> <p>INSTRUCTIONS: Circle any of the lab tests which are elevated or reduced, using your hospital's normal values.</p> <table border="0"> <tr> <td>1. Uric Acid</td> <td>8. Alkaline Phosphatase</td> </tr> <tr> <td>2. SGOT</td> <td>9. Blood Alcohol</td> </tr> <tr> <td>3. GGT</td> <td>10. Gamma GT</td> </tr> <tr> <td>4. LDH</td> <td>11. Triglycerides</td> </tr> <tr> <td>5. Bilirubin</td> <td>12. Cholesterol</td> </tr> <tr> <td>6. Prothrombin Time</td> <td>13. Macrocytosis</td> </tr> <tr> <td>7. Blood Sugar</td> <td></td> </tr> <tr> <td>14. Potassium</td> <td>15. Magnesium</td> </tr> </table>		1. Uric Acid	8. Alkaline Phosphatase	2. SGOT	9. Blood Alcohol	3. GGT	10. Gamma GT	4. LDH	11. Triglycerides	5. Bilirubin	12. Cholesterol	6. Prothrombin Time	13. Macrocytosis	7. Blood Sugar		14. Potassium	15. Magnesium																						
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<p>C. MAST TEST:</p> <p>Patient Score _____</p> <p>Significant Other Score _____</p> <p>Patient Refused _____</p> <p>Patient Unable to Complete _____</p> <p>Physician Refused _____</p> <p>INSTRUCTIONS: If patient or significant other score ≥ 4 points, refer to liaison physician. If MAST is not given to patient, refer for retrospective review by MHA.</p>																																							
<p>D. POSITIVE DRINKING HISTORY:</p> <p>Positive drinking history - physician statement of a history of drinking problems or any statement by a nurse or physician of alcohol interfering with the social, work, or school life of the patient, or a history of episodes of intoxications. (Check ER records). Record notation below.</p>																																							
<p>E. MEDICATION PATTERNS:</p> <p>Admission medication history of patient using any of the following types of drugs: sedatives, analgesics or tranquilizers. Specify drug name.</p>																																							
<p>F. OTHER SIGNIFICANT HISTORY:</p> <p>1. Legal problems (e.g. driving while intoxicated, vagrancy, assault).</p> <p>2. Social problems (e.g. child abuse, wife battering, sexual dysfunction).</p>																																							
<p>CRITERION 2: ADEQUATE DRINKING HISTORY <input type="checkbox"/></p> <p>INSTRUCTIONS: History must include NO notation of the effect of alcohol consumption on the daily activities of the patient. Place an "x" in the box if no notation.</p>																																							
<p>CRITERION 3: PREVIOUS ADMISSION FOR ALCOHOLISM, MEMBERSHIP IN ALCOHOLIC'S ANONYMOUS, OR FAMILY MEMBERSHIP IN ALANAR <input type="checkbox"/></p> <p>INSTRUCTIONS: Check history, progress notes, and, if possible, all previous admissions.</p>																																							

TABLE 2

Distribution of Patients by Hospital Service		
Hospital Service	No of Patients	
Medicine	442	(44%)
Surgery/Ortho	330	(33%)
OB/Gyn	137	(14%)
Psych	55	(5%)
Pediatrics	18	(2%)
Not indicated	12	(1%)
Other	10	(1%)
Total No. Patients	1,004	
Male	396	(39%)
Female	608	(61%)

TABLE 3. Proportion of Patients Exhibiting Medical Indications and Abnormal Laboratory Tests

N = 1004			
	Total	Number of "Potential" Alcohol Abusers Exhibiting the Following Conditions (N = 192)	Percentage of the Total
A. MEDICAL INDICATIONS:			
1. GI Bleeding	21	9	43%
2. Pneumonia	13	3	23%
3. Hypertension (Admit BP > 140/90)	107	35	33%
4. Hepatomegaly	5	4	80%
5. Cirrhosis	4	4	100%
6. Malnutrition	7	1	20%
7. Hepatitis	11	6	55%
8. Jaundice	3	2	67%
9. Ascites	10	6	60%
10. Gastritis	38	12	32%
11. Trauma	5	2	40%
12. Hallucinations	6	2	33%
13. Seizures	--	--	--
14. Burns	--	--	--
15. Delirium Tremens	2	1	50%
16. Pancreatitis	2	2	100%
17. Withdrawal (Abstinence syndrome)	58	18	31%
18. Depression	2	1	50%
19. Macrocytosis without anemia	8	3	38%
20. Polyneuropathy	--	--	--
21. Tuberculosis	11	5	45%
22. Multiple Admissions	12	4	33%
23. Fractures	5	1	20%
24. Hemoptysis	5	2	40%
25. Aggressive Behavior	1	1	100%
26. Absence from school or work	7	2	29%
27. Personality Changes	1	--	--
28. Multiple ecchymotic areas	2	1	50%
29. Fatty infiltration of liver	9	5	56%
30. Memory loss (blackouts/amnesia)	2	1	50%
31. Tremors (unexplained)	5	3	60%
32. Social Isolation	49	18	37%
33. Any mental illness diagnosis	--	--	--
34. Increased or high tolerance to alcohol	10	6	60%
35. History of suicide attempts			
B. LABORATORY TESTS:			
ELEVATED:			
1. Uric Acid	67	14	21%
2. SGOT	73	31	43%
3. GGPT	2	2	100%
4. LDH	56	17	30%
5. Bilirubin	42	18	43%
6. Prothrombin Time	6	1	17%
7. Blood Sugar	147	39	27%
8. Alkaline Phosphatase	86	19	22%
9. Blood Alcohol	5	5	100%
10. Gamma GT	54	28	52%
11. Triglycerides	38	12	32%
12. Cholesterol	42	12	29%
12. Macrocytosis	8	4	50%
REDUCED:			
1. Potassium	54	13	24%
2. Magnesium	--	--	--

the Criteria Committee, National Council on Alcoholism.⁴

The validity of the diagnosis screen was tested in two pilot hospitals with favorable results before the actual study began.

Methods

Records of 1,004 patients from seven Minneapolis-St. Paul metropolitan area hospitals were screened upon admission during the month of October, 1979. A stratified sample was selected according to the proportion of hospital admissions on each service (Table 2). All admissions with a diagnosis of alcoholism, and pediatric patients under the age of 12, were excluded from the sample.

The MAST was administered to the patient by a trained interviewer after the admission date. The patient (or guardian if patient was under age 18) could refuse to take the MAST; similarly, the attending physician could refuse permission for his patient to take the MAST.

When any patterns or indicators listed in the diagnosis screen were found on the medical record, the chart was referred to a liaison physician for review. Records of patients who scored four and above on the MAST were also referred for physician review.

If the reviewing physician(s) felt that a patient's medical record and/or MAST score gave the suspicion of alcohol abuse, the attending physician was then contacted for further information and review.

Results

Of the 1,004 records reviewed, approximately 19 percent (192 patients) were determined to be potential

TABLE 4
Distribution of MAST Respondents and Non-Respondents

	TOTAL
Total No. Patient Records	1,004
No. Patients — MAST test given	585
Patients — MAST not given	419
Reasons:	
M.D. refused	78
Patient refused	33
Discharged before interview	205
Patient confused or unable	83
Other	21
No. Significant Others Taking MAST	148

TABLE 5
Distribution of MAST Scores

	No. of Patients	Range of Scores	Mean Score
MAST ≥ 4	114	4-49	13
MAST < 4	471	0-3	1

SCORING SYSTEM

Michigan Alcoholism Screening Test	
QUESTIONS	ANSWERS WITH WEIGHTED SCORING
1. Do you feel you are a normal drinker? (If patient denies any use of alcohol check here _____.)	Yes _____ No <u>2</u>
2. Have you ever awakened the morning after some drinking the night before and found that you could not remember a part of the evening before?	Yes <u>2</u> No _____
3. Does your spouse (or parental) ever worry or complain about your drinking?	Yes _____ No <u>2</u>
4. Can you stop drinking without a struggle after one or two drinks?	Yes <u>1</u> No _____
5. Do you ever feel bad about your drinking?	Yes _____ No <u>2</u>
6. Do friends or relatives think you are a normal drinker?	Yes _____ No _____
7. Do you ever try to limit your drinking to certain times of the day or to certain places?	Yes <u>0</u> No <u>2</u>
8. Are you always able to stop drinking when you want to?	Yes _____ No <u>2</u>
9. Have you ever attended a meeting of Alcoholics Anonymous (AA)?	Yes <u>5</u> No _____
10. Have you gotten into fights when drinking?	Yes <u>1</u> No _____
11. Has drinking ever created problems with you and your spouse?	Yes <u>2</u> No _____
12. Has your spouse (or other family member) ever gone to anyone for help about your drinking?	Yes <u>2</u> No _____
13. Have you ever lost friends or girlfriends/boyfriends because of drinking?	Yes <u>2</u> No _____
14. Have you ever gotten into trouble at work because of drinking?	Yes <u>2</u> No _____
15. Have you ever lost a job because of drinking?	Yes <u>2</u> No _____
16. Have you ever neglected your obligations, your family, or your work for two or more days in a row because you were drinking?	Yes <u>2</u> No _____
17. Do you ever drink before noon?	Yes <u>1</u> No _____
18. Have you ever been told you have liver trouble? Cirrhosis?	Yes <u>2</u> No _____
19. Have you ever had optimum tremors (DTs), severe shaking, heard voices, or seen things that weren't there after heavy drinking?	Yes <u>2</u> No _____
*20. Have you ever gone to anyone for help about your drinking?	Yes <u>5</u> No _____
*21. Have you ever been in a hospital because of drinking?	Yes <u>5</u> No _____
*22. Have you ever been a patient in a psychiatric hospital or on a psychiatric ward of a general hospital where drinking was part of the problem?	Yes <u>2</u> No _____
*23. Have you ever been seen at a psychiatric or mental health clinic, or gone to a doctor, social worker, or clergyman for help with an emotional problem in which drinking had played a part?	Yes <u>2</u> No _____
24. Have you ever been arrested, even for a few hours, because of drunk behavior?	Yes <u>2</u> No _____
25. Have you ever been arrested for drunk driving or driving after drinking?	Yes <u>2</u> No _____

*Do not include this possible episode or any subsequent consultation that led to this hospital episode.

To score the test, add up the total points according to the above totals. If the total number is four or more points, the patient should be considered a variation to the first criterion and the liaison physician consulted.

TABLE 6
Indicators Exhibited by Patients Identified as Having
"Potential" for Alcohol Abuse
N = 192

Indicator	N = 192 "Alcoholic" Patients	N = 1004 Total Sample
I. A) Medical Indications	97 (51%)	296 (29%)
B) Abnormal Laboratory Tests	92 (48%)	339 (34%)
D) Positive Drinking History	58 (30%)	64 (6%)
E) Medication Patterns	41 (21%)	135 (13%)
F) Other Significant History	25 (13%)	32 (3%)
II. Previous admission or treatment for alcoholism	30 (16%)	30 (3%)

TABLE 7
Age and Sex Distribution of Potential Alcoholics

Age Range	Male	Female	Total
12-19	8	10	18 (9%)
20-29	18	16	34 (18%)
30-39	18	17	35 (18%)
40-49	17	9	26 (14%)
50-59	28	5	43 (22%)
60-69	15	7	22 (12%)
70 +	11	3	14 (7%)
	115 (60%)	77 (40%)	192

or suspicious alcoholics. Approximately sixty percent were male and forty percent female.

The most positive medical indicators for alcoholism included hepatomegaly, cirrhosis, ascites, gastritis, and withdrawal or abstinence syndrome (Table 3).

The most common abnormal laboratory tests were elevated SGOT, GGPT, blood alcohol, Gamma GT, and macrocytosis.

A total of 585 patients (58%) took the MAST (Table 4). Twenty percent scored four and above, indicating a positive potential for alcohol abuse. Thirty-three patients refused the MAST. Two of these patients were teenagers whose parents refused to give permission for the MAST. Seventy-eight patients did not take the MAST because their physicians refused.

Of the 114 patients with a positive MAST score, nearly half (50 records) did not have documentation of drinking history by physicians (Table 11). The study shows that a diagnosis screen for alcoholism does work.

Discussion

This study demonstrated a 19 percent prevalence of alcoholism among general hospital ward patients. Our findings suggest that 12 percent of the male ward patients and eight percent of the female ward patients exhibit drinking problems.

The study emphasized the fact that sixty-percent of all records lacked physician documentation of drinking history. Thirty-nine percent of the records had neither physician nor nursing documentation of the patients' drinking patterns. These observations are consistent with the findings of Westermeyer⁶ that concluded "physicians and nurses were not willing to formally

identify substance abuse problems."

Physician should document each patient's drinking pattern.

Physician should be encouraged to use a diagnostic screen and the MAST questionnaire.

The diagnosis of alcoholism, coupled with intervention and follow-up, should be the responsibility of all physicians.

TABLE 8

Profile of Number of Patients Who Showed Evidence for Potential Alcohol Abuse

No. of Records	1,004
No. of Patients with Previous Treatment	30
Other Patients Known to Have "History of Abuse"	31
Potential Alcoholics Identified from Study Results	131
Total No. of Potential Alcoholics	192 (19%)

TABLE 10

Documentation of Drinking History

Total No. of Hospital Records	1,004
No. of Charts Without Physician Documentation	659 (66%)
No. of Charts With Nursing Documentation When There Is Not Physician Documentation	266 (27%)
Total Number of Charts Without Any Documentation	393 (39%)

TABLE 11

Patients with MAST Score ≥ 4 Lacking Documentation of Drinking History

No. of Patients with MAST ≥ 4	114
Records with Drinking Documentation	64 (56%)
Records Lacking Drinking Documentation	50 (44%)
• No. Male	• 34 (68%)
• No. Female	• 16 (32%)

TABLE 9

Relation of Diagnosis Screen Indications and MAST Score on Patients Given MAST +

Percentage of Patients Exhibiting Indicators


Alcoholism Indicator	MAST ≥ 4 N = 114		MAST < 4 N = 471		For Information Only MAST Not Given N = 419	
Medical Indications	46	(40%)*	119	(25%)	128	(31%)
Abnormal Lab Test	42	(37%)	159	(34%)	138	(33%)
History of Drinking Problems	31	(27%)	8	(2%)	33	(8%)
Medication Patterns	21	(18%)	61	(13%)	52	(12%)
Other Significant History	16	(14%)*	7	(1%)	14	(3%)
Absence of Physician Documentation of Drinking Patterns	53	(46%)	310	(66%)	287	(68%)
Previous Treatment for Alcoholism	20	(18%)*	1	(.2%)	9	(2%)

* $p < 0.005$ (X^2 , d.f. = 1).

+Chi-square used to test the significance of a positive MAST score and presence of indicator(s).

See references, page 225.

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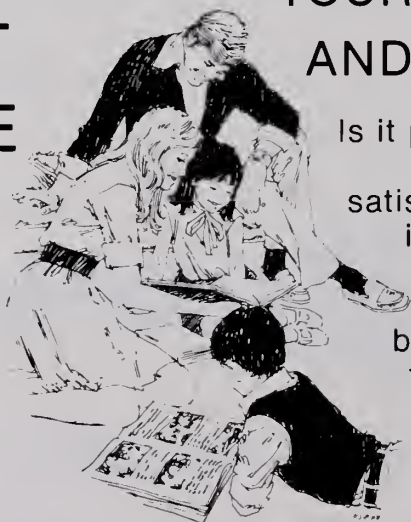


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Minnesota Department of Health

Incidence, Prevalence, Mortality and Population-Based Profile of Diabetes Mellitus in Wadena, Minnesota. 1981

ALAN P. BENDER, D.V.M., Ph.D.;* J. MICHAEL SPRAFKA, M.S.;† HELEN JAGGER, R.N., M.P.H.;‡
JULIA WANNAMAKER, Ph.D., M.P.H. # KENNETH H. MUCKALA, M.D.§

Complete ascertainment of all diabetic individuals in a community is not possible utilizing hospital records alone. Studies of diabetes based on hospital records are biased toward the complication phase of the disease relative to the total population with diabetes. A complete epidemiologic study of diabetic individuals living in Wadena, Minnesota (population 4,699, 1980) was conducted using population-based methodology. The use of physician diagnoses of diabetes without additional diagnostic review yielded an average annual incidence rate for Type II diabetes of 101 per 100,000 (age-adjusted to 1970 U.S. white population). The prevalence of diabetes as of January 1, 1979 was 1.73% (age-adjusted to the same standard). These results correspond very closely to those of a Mayo Clinic population-based study of Rochester, Minnesota that used more rigorous diagnostic criteria. It was concluded that through the cooperation of the local medical community and civic leaders, complete ascertainment of individuals with diabetes living in a defined area is possible.

THE MINNESOTA DEPARTMENT OF HEALTH in the first year of its participation in the Centers for Disease Control (CDC) Diabetes Control Project has initiated population-based epidemiologic studies of diabetes mellitus in order to provide the foundation for control programs.^o

Mortality data are only one element of a complete study of diabetes.¹⁻⁴ Two reports by the National Academy of Sciences conclude that Professional Standards Review Organization (PSRO) hospital-based data may not be reliable for research or programmatic use.^{5,6} Also, it has long been known that hospital-based data are generally biased relative to the total population and these biases can substantially affect the perceived natural history of the disease under study.^{7,8} Recognizing the need for more detailed studies of diabetes mellitus, the

Diabetes Epidemiology Workgroup of the National Diabetes Advisory Board has made several recommendations supporting the conduct of population-based epidemiologic studies of diabetes.⁹

Wadena is the first of several Minnesota cities to be enrolled in the MDH population-based studies. Descriptive and quantitative population-based profiles derived from these studies should provide detailed insights into this disease which are not available from other studies. The scope and hypotheses of the Minnesota Diabetes Control Project have been detailed previously.¹⁰ One objective of a control program is primary prevention. Basing programs upon profiles of individuals which, by definition of hospitalization and mortality have more severe disease than the rest of the diabetic population, does not address the information required to prevent these outcomes. Hypotheses addressing why some persons with diabetes develop untoward complications and others do not must be evaluated. This is best accomplished through population-based studies.

This paper reports on ascertainment methodology, descriptive and medical profiles of the diabetic population of Wadena, incidence and prevalence of

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^oStudy approved by the Committee on the Use of Human Subjects in Research, University of Minnesota.

diabetes in Wadena, and an evaluation of Wadena diabetic mortality.

Methods

Methods used to identify all persons with diabetes living within the city of Wadena, Minnesota have been previously described.¹⁰ An effort was made to identify all individuals diagnosed by a physician as having diabetes mellitus who lived in Wadena during the period January 1, 1979 to July 1, 1981. The medical clinic and hospital, referral hospitals, local diabetes teaching team, pharmacies, nursing home, and public health nursing were used as sources for diabetic identification as well as for documents that were abstracted into a profile of the patient's medical history. Media exposure was obtained from the local paper and radio station. The city council supported two mail surveys which were included in the utility bills. These latter techniques provided additional case ascertainment which was verified from medical records.

Records abstracted from the above sources were coded for analysis. All personal identification was removed and replaced by a code number. Reasons for clinic visit or hospitalization were classified into eight categories (Table 1). Follow-up from diagnosis to July 1, 1981 was accomplished through medical records or the local post office. When a patient died, the death certificate was obtained from the MDH Division of Vital Statistics and causes of death compared to known medical history. Total number of clinic visits (or hospitalizations) for each of the eight categories was divided by the number of years of post-diagnostic follow-up in which the medical encounters occurred. This provided a yearly rate for these events that could be compared among patients.

Incidence and prevalence were compared to the published results of a population-based study of diabetes in Rochester, Minnesota.¹¹ Comparisons

were made through direct and indirect standardizations¹² and the significance of the indirectly standardized observed to expected (O/E) ratios was evaluated by the method of Bailar.¹³

Results

A total of 729 individuals were identified from all sources as potential candidates for the study. Of the potential cases, 578 were determined to be ineligible because they lived outside of Wadena for the entire study period, were diagnosed after July 1, 1981, or they could not be confirmed through medical records

TABLE 2
Distribution of Sources Through Which
Diabetic Individuals Were Initially Located

Source	Number (%)
Clinic*	126 (84)
Nursing Home	8 (5)
Survey	7 (5)
Hospital†	3 (2)
Public Health Nursing	3 (2)
Diabetes Teaching Team	3 (2)
Pharmacy	0 (0)
TOTAL	150 (100)

*First source used was the clinic computer-based system. Therefore, most diabetics were initially found in this source although 19 (13%) had clinic records but were not originally found in this system.

†Only those patients that were initially found through hospital records after completion of the clinic search.

TABLE 3
Proportion of Diabetic Records by Source

Source	Number (%)
Clinic	145 (97)
Hospital*	107 (71)
Pharmacy	57 (38)
Two Surveys	51 (59)†
Nursing Home	37 (25)
Public Health Nursing	24 (16)
Diabetes Teaching Team	20 (3)

*Only 70 (47%) were initially identified from PAS abstracts, 37 (24%) of the 107 individuals were identified from other sources that were later found to be in the hospital records.

†Percentage based upon a denominator which excluded nursing home and those that died or moved away before the surveys.

TABLE 1
Classification of Reasons for Medical Encounter

Category	Examples
Metabolic Complications	Ketoacidosis, Hyperosmolar Coma, Insulin Reaction, "Diabetes Out Of Control"
Routine Diabetes	Insulin Adjustment, Evaluation of Treatment Regimen, Diabetes Follow-up or Check up, Diabetes Education
Renal	Renal Disease, Renal Failure, Kidney Transplantation, Dialysis
Eye	Cataracts, Retinopathy, Visual Acuity Problems
Neurologic	Neuropathy, Autonomic Insufficiency, Paresthesia, Impotence
Infections	Cellulitis, Pyelonephritis, Fungal Sinusitis, Vaginitis, Cystitis
Cardiovascular	Foot Problems, Gangrene, Amputation, Angina, Claudication, Night Cramps, Hypertension, Stroke
Other	Laboratory Tests Not Associated with Diabetes, All other Non-Diabetes Related Problems

(or physician inquiry) as having diabetes. The remaining 151 met all study criteria. Only one person, whose medical records were outside the Wadena medical system (Fargo, N.D.), refused permission for medical records review. Therefore, prevalence estimates were based upon 151 individuals and medical profiles were based upon abstracted medical records of 150 diabetic individuals.

Persons with diabetes were located concurrently through many sources. Only 8 (5%) were found in one source, while 41 (27%), 61 (41%), 31 (21%), 8 (5%), and 1 (1%), were found in two, three, four, five, and six sources respectively. All sources, with the exception of pharmacy records, provided initial identification of individuals with diabetes. Twenty-two diabetics (14%) would have been missed if clinic and hospital records were used as sole sources, excluding secondary sources (i.e., nursing home, survey, diabetes teaching team, public health nursing, pharmacy), of identification (Table 2). Eighty (53%) would have been missed if hospital records had been used as the sole source of identification (Table 3). Many of those that would have been missed initially were subsequently found to have both hospital and clinic records, but for several reasons, were not included in PAS summaries or the clinic's computer-based system. Table 3 contains the final distribution of the location of all diabetic records.

Of the total 150 persons with diabetes profiled, all were caucasian. Their average age at diagnosis was 61.5 years, the average length of post-diagnosis follow-up was 7.2 years, their average age as of January 1, 1979 was 68.0 years, and 99 (66%) were female. The sex distribution could be misleading because of the older age of these individuals. Using age-and sex-specific prevalence from the Rochester study to adjust for the effect of age on survivorship, females remained significantly over represented relative to the Rochester data ($p < 0.01$). Fifty-one of the 85 prevalent female subjects on January 1, 1979 were 70 or more years of age and the majority lived in the local nursing home.

Estimates of diabetes prevalence in Wadena are

given in Table 4. The overall crude prevalence remained constant at about 2.6% during the study period. A comparison between published Rochester prevalence and that for Wadena by indirect standardization indicated that overall Wadena prevalence estimates were very similar to those of Rochester (Table 4).

Inclusion of nursing home residents in prevalence calculations represented a compromise. Many diabetic residents did not live in Wadena prior to entering the nursing home. Others went to nursing homes outside of Wadena. The assumption of equal in-and out-migration may not have been valid. Also, diagnosis of diabetes in the elderly becomes more subjective. Therefore, prevalence was recalculated excluding nursing home residents and results were also found to be consistent with the Rochester data (Table 4).

Many sources were used to identify persons with diabetes. To approximate the effect of additional ascertainment beyond clinic and hospital records, subjects initially identified through secondary sources were excluded and prevalence estimates were recalculated (Table 4). These estimates (which included nursing home residents) were equivalent to estimates expected from the Rochester data.

Using the 1970 U.S. white population as a standard, the January 1, 1979 crude prevalence of 2.6% was adjusted to 1.7%. Age -and sex-specific prevalence estimates for Wadena are given in Table 5. For both males and females, prevalence of diabetes in Wadena increased with age.

There were 10 people who were less than 25 years of age and had insulin prescribed at the time of

TABLE 5
Prevalence of Diabetes Mellitus By Age
and Gender as of January 1, 1979 (per 1,000 population)
Age In Years

Gender	< 50	50-70	70+	Age-Adjusted Prevalence*
Male	5.3	38.8	59.3	13.6
Female	3.2	56.2	116.2	21.0
Total	4.2	48.5	95.4	17.3

*Age-adjusted to 1970 U.S. white population

TABLE 4
Estimates of Diabetes Prevalence (Percent) in Wadena and
Indirectly Standardized Observed-to-Expected (O/E) Ratios*

Date	Overall		Without Nursing Home		Initial Hospital and Clinic Identification	
	Crude	O/E	Crude	O/E	Crude	O/E
1/1/79	2.6%	1.15	2.0%	0.86	2.3%	0.99
4/1/80	2.7%	1.16	2.1%	0.91	2.7%	1.05
7/1/81	2.6%	1.13	2.0%	0.85	2.3%	1.00

*Expected number calculated from Rochester study. (None of the O/E ratios were significant at the $p = 0.05$ level.)

diabetes diagnosis. These individuals were considered to have Type I diabetes and all were prevalent as of January 1, 1979. Their average age at diagnosis was 14.5 years; their average length of follow-up was 11.5 years; there were four males and six females; and all ten presented with polyuria and polydipsia.

There were 21 individuals with Type II (not Type I as defined above) diabetes that developed their disease during the study period. The distribution of age at diagnosis for incident cases was shifted to older ages (Figure) compared to Rochester. Since younger diabetic individuals were prevalent, this shift is likely due in part to the short (2.5 years) time period in which incident cases could have occurred. The average annual incidence rate of Type II diabetes adjusted to the 1970 U.S. white population was 101 per 100,000.

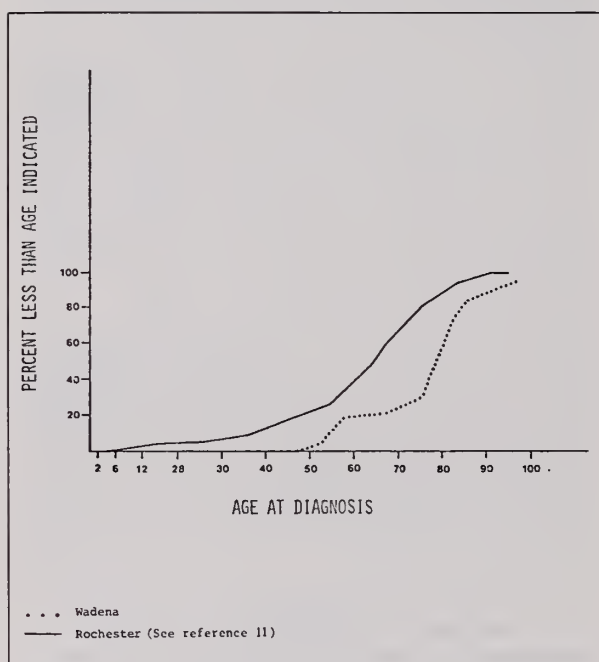


Figure — Distribution of Age at Diagnosis of Diabetes Mellitus for Incident Cases

Diabetes (Type I and Type II) in Wadena had an average of 9.2 clinic visits and 1.3 hospitalizations per year of post-diagnosis follow-up (Table 6). Also included in Table 6 are general diabetic hospital and clinic profiles. Since a medical encounter could have been for more than one major reason, specific reasons for encounters do not add to the total number of encounters. Routine diabetes care was the major reason for clinic visits (4.8/year) while cardiovascular problems and metabolic complications were the major specific reasons for hospitalization (0.9/year).

Sixty-six (44%) of the 150 diabetic medical records indicated a positive family history. Fifty-three (35%) had immediate family members with diabetes, and thirteen (9%) had other (non-immediate) family members with diabetes. Of the 107 diabetics with hospital records, only 17% had an indication in their record of symptomatology that included polyuria, polyphagia, or polydipsia. Of the 145 diabetics with clinic records, 21% had these symptoms. Of the 107 individuals hospitalized for diabetes, 33% had information regarding the initial treatment for diabetes, and 65% of the 145 diabetic individuals with clinic records had this information. The distribution of initial treatment is given in Table 7.

Eighteen of the 151 subjects died during the study period. The expected number of deaths from diabetes

TABLE 7
Initial Treatment as indicated in
Hospital and Clinic Records

Treatment	Hospital (N = 35)*		Clinic (N = 94)*	
	Number	(%)	Number	(%)
Insulin	3	(8)	5	(5)
Oral	6	(16)	29	(31)
Diet	9	(25)	27	(29)
Diet and oral	10	(28)	29	(31)
Insulin and Diet	6	(17)	3	(3)
Insulin and oral	1	(3)	1	(1)

*In many instances (72 for hospital and 51 for clinic) initial treatment could not be determined from the medical record

TABLE 6
Reasons for Clinic and Hospital Encounters*
Point Estimates (\bar{x}) and 95% Confidence Intervals (CI)

Reasons for Encounter Per Year	Clinic		Hospital	
	\bar{x}	95% CI	\bar{x}	95% CI
Metabolic Complications	0.8	(0.5, 1.2)	0.9	(0.6, 1.1)
Routine Diabetes	4.8	(4.2, 5.3)	0.08	(0.01, 0.15)
Renal	0.04	(0.01, 0.06)	0.03	(0.01, 0.05)
Eye	0.5	(0.3, 0.7)	0.08	(0.03, 0.13)
Neurologic	0.3	(0.2, 0.4)	0.2	(0.09, 0.3)
Infection	0.9	(0.6, 1.2)	0.4	(0.2, 0.5)
Cardiovascular	1.3	(0.9, 1.7)	0.9	(0.6, 1.2)
Other	2.9	(2.4, 3.3)	1.0	(0.6, 1.5)
Number of Total Visits	9.2	(8.2, 10.1)	1.3	(0.9, 1.6)

*See Table 1 for classification of reasons for medical encounter

as an underlying cause is 1.8 (Minnesota, 1978) for an O/E ratio of 10.0. Using underlying and contributing causes (Minnesota, 1976) the expected number is 8.2 for an O/E ratio of 2.2 which would underestimate diabetic mortality by at least one-half. Only five of the eighteen death certificates (28%) had any mention (underlying or contributing cause) of diabetes. Table 8 gives the underlying cause of death as reported on their death certificate for the 18 persons with diabetes who died during the study period.

TABLE 8

**Underlying Cause of Death in Prevalent
Wadena Diabetic Individuals
January 1, 1979-July 1, 1981**

Cause of Death	Males	Females	Total
Coronary Heart Disease	1	7	8 (44%)
Stroke	2	3	5 (27%)
Malignancy	0	2	2 (11%)
Pneumonia	0	1	1 (6%)
Arteriosclerosis	1	0	1 (6%)
Liver Disease	0	1	1 (6%)
Total	4	14	18 (100%)

Discussion

Conduct of population-based studies requires support from the local medical community and civic leaders. With this cooperation complete ascertainment of all persons with diabetes is possible. Through the support and cooperation of the Wadena community, the vast majority of individuals with physician-diagnosed diabetes living in Wadena any time between January 1, 1979 to July 1, 1981, were identified and profiled.

An estimate of the number of individuals with diabetes that would have satisfied study criteria yet were not identified can be approximated from survey results. Table 2 demonstrates that seven additional (at that time unknown) people with diabetes identified themselves through two mail surveys. From Table 3 we see that 59% of the total eligible study participants identified themselves during the survey. Therefore, about five diabetic individuals may have gone unidentified. This is probably an overestimate since, of the seven initially found in the mail surveys, several were subsequently identified in routine review of other sources. However, even the loss of five would imply that 97% of the people with diabetes in Wadena satisfying study criteria were identified.

Since this was a study of medical records, elements of treatment or diagnosis not written in the record were not available for analysis. No patient contact nor interview (except for identification statements in

surveys) was conducted to expand or clarify the histories. Yet, medical record studies appear to be an accurate and efficient method for constructing a descriptive population-based picture of diabetes. It is more accurate than that based solely upon physician or patient recall and provides a complete picture of morbidity unobtainable from any other source. For example, Table 6 demonstrates the reasons for medical encounters per year. For this population more than fifty percent of the clinic visits per year, over an average of seven years, involved routine diabetes care. This kind of information is unavailable from summary hospital discharges alone.

Using physician diagnoses of diabetes without additional diagnostic review yielded an average annual incidence rate for Type II diabetes of 101 per 100,000 (age-adjusted to 1970 U.S. white population). These rates compare favorably with the Mayo Clinic study that used more rigorous diagnostic criteria.¹¹ For their study period they estimated the overall incidence rate adjusted to the same standard as 133 per 100,000. This included a schoolage children component, presumably of Type I diabetes, (14 per 100,000) that was not included in the Wadena Type II estimate. A 1976 estimate for the incidence of diabetes in the United States was 300 per 100,000.¹⁴ This estimate was based upon interview data from the National Center for Health Statistics. Although the Wadena estimate was based on only 21 incident (newly diagnosed) cases it supports the Rochester estimate and may indicate that Minnesota's diabetes incidence is lower than the reported national rate.

The prevalence of diabetes in Wadena as of January 1, 1979 was 1.73% compared to an equivalently standardized value of 1.61% in Rochester. The increase in prevalence with age (Table 5) observed in Wadena is consistent with the observation in the Rochester and Framingham¹⁵ population-based studies.

Concordance of incidence and diabetes prevalence between Wadena and Rochester may be misleading. The two diabetic populations were not as similar as these results imply. In Wadena, females had a higher prevalence that could not be accounted for by age-adjustment. The higher prevalence in females was consistent with a widely held belief that females are more susceptible to Type II diabetes.¹⁶ In Rochester, males had the higher prevalence (this observation has been reported elsewhere¹⁷).

How much of this sex-specific shift is due to the effect of the nursing home is unclear. Calculations which excluded the nursing home brought the Wadena

results closer to the Rochester distributions. Also, it is not known how many of the Wadena diabetes diagnoses would have passed the diagnostic criteria of the Mayo Clinic study. Potential exclusions from the Wadena study using the diagnostic criteria of the Mayo Clinic would also substantially affect comparability.

It is difficult to determine from many of the published reports whether reported prevalence is crude or age-standardized. Crude prevalence is not useful for comparisons. For example, in the epidemiology of diabetes, age has a strong impact on the sex ratio.¹⁶ In Wadena, crude prevalence was 2.6% and when age-adjusted to the 1970 standard the prevalence estimate dropped to 1.7%. However, it appears that the prevalence of diabetes in Wadena was consistent with results of a recent summary report of diabetes prevalence in the United States.¹⁸ The 1975 estimate of diabetes prevalence based upon data from the Health Interview Survey was 2.4% for the North Central area of the United States.¹⁹ Close agreement of these reports and the Rochester data with results from Wadena support the use of physician-defined diabetes as an epidemiologic case definition.

Death certificates are known to provide an incomplete picture of diabetes.^{1,2,3,4} Results from Wadena give additional insight into the magnitude of potential errors inherent in these sources. Depending upon the Minnesota mortality rate used, there would be a 120 to 900 percent under-representation of mortality in individuals with diabetes. It is not suggested that diabetes would or should be mentioned on all death certificates, however, it is important to appreciate that a change in physician recognition or perception of the importance of diabetes could substantially modify mortality rates without any change in the disease itself.

The distribution of underlying causes of death on death certificates (Table 8) of the 18 deceased diabetic

individuals in Wadena was very similar to that of the Mayo study. The proportion of death certificates that mentioned diabetes as an underlying or contributing cause was 28 percent. This compared well to the 32 percent reported in Rochester. The observation that none of the 18 Wadena death certificates reported an underlying cause of death of diabetes mellitus was consistent with the finding of Entmacher and Marks that there is an inverse relationship between age at death and finding diabetes recorded as an underlying cause of death.²⁰ The average age at death of the 18 deceased subjects was 80 years.

The goals of this study were modest. A descriptive study of 150 diabetic individuals should be extended beyond the study site cautiously. However, one of the major lessons of Wadena was that people with diabetes appeared in many medical and community sources. (Table 3) Using multiple sources for identification facilitated ascertainment but disguised the source dependence of diabetic profiles. The hospital and clinic record systems in Wadena are excellent. However, 53 percent of hospitalized diabetic individuals and 13 percent of those with clinic records had to be identified from secondary sources before they were located in the hospital or clinic. That is, if secondary sources had not been used, these individuals would have been missed. A subsequent article to be published will examine the effect that the individual sources had on the perceived natural history of diabetes in Wadena. Certainly, relative to prevalence and incidence, no single source was adequate to describe Wadena's diabetes morbidity.

Acknowledgment

The Minnesota Department of Health acknowledges the cooperation and interest of the medical community, civic leaders, and citizens of Wadena without which this study could not have been conducted.

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Minnesota Medical Association

1983 Nominating Committee Report

These profiles are of physicians nominated by the MMA Nominating Committee for election at the 1983 MMA House of Delegates on May 19, 1983. Nominations may also be made from the floor of the House.

President-Elect

Thomas G. Briggs, M.D.

Board certified in family practice, Dr. Briggs is a MMA Trustee representing the metropolitan area and a former MMA secretary. He practices in White Bear Lake, and he is the medical director of St. John's Hospital chemical dependency unit in St. Paul.

In 1976, Dr. Briggs was president of the Ramsey County Medical Society. He has served as chairman of the Resource Group on Alcoholism and Other Chemical Dependencies. He has been active on the Legislative Committee, the Public Health Education Committee, the Administration and Finance Committee, Membership and Public Services Council, and the Impaired Physicians Committee which he has chaired since 1977.

His past committee activities include General Practice, Family Practice, and Mental Health. Dr. Briggs served as a MMA delegate and is a member of the AMA.

Vice-President

M. Elizabeth Craig, M.D.

Dr. M. Elizabeth Craig is a pediatrician in practice in St. Louis Park and is completing her first term as vice-president of MMA. Having practiced medicine since 1945, Dr. Craig held the position of chief of staff at Methodist Hospital in St. Louis Park in 1978. She is a member of the Hennepin County Medical Society, has served as a MMA delegate since 1979, and is currently a member of the MMA Public Health Committee and the AMA.

Treasurer

Paul S. Blake, M.D.

Dr. Paul S. Blake has served as MMA treasurer since 1977. He is also chairman of the Administration and Finance Committee of the Board of Trustees and a former member of the Membership and Public Services Council.

Board certified in neurosurgery, Dr. Blake practices in Minneapolis.

He is past president of the Hennepin County Medical Society and has served on the Permanent Evaluation Committee, the Scholarship and Loans Committee, and the Nominating Committee. He is a member of the AMA and has been a MMA delegate.

Secretary

Ellen R. Stubbs, M.D.

Dr. Ellen R. Stubbs is a board certified family physician in St. Paul and chair of the MMA Committee of Women Physicians. She is a member of the Ramsey County Medical Society, and since 1979 has served as a MMA alternate delegate or delegate from RCMS. This year she is chairing the RCMS delegation.

From 1978 to 1979, Dr. Stubbs served as a member of the CME Committee for the Ramsey County Medical Society and has been a member of the RCMS Membership Committee since 1980. An AMA member, Dr. Stubbs is the current chair of MMA's Nominating Committee.

NOMINATING COMMITTEE REPORT

Speaker of House Delegates

Richard K. Simmons, M.D.

Dr. Richard K. Simmons is serving his second term as Speaker of the MMA House of Delegates. A former vice speaker of the House, Dr. Simmons served as a MMA delegate from 1975 to 1979.

He is board certified, has been engaged in family practice in Bloomington since 1958, and has held numerous positions and offices in the Minnesota Academy of Family Physicians, including selection as the 1979-80 Merit Award recipient. A past president and Chairman of the Board of the Physicians Health Plan, Dr. Simmons is currently medical director for the Plan. He has also served as a member of the Board of Directors of the American Association of Foundations for Health Care and for three years as a director of the Hennepin County Medical Society. Dr. Simmons has been active on the MMA Executive Committee and is a member of the AMA.

Vice Speaker of House of Delegates

John M. Burns, M.D.

Dr. John M. Burns is vice speaker of the MMA House of Delegates. He is the corporate director of occupational/environmental health at Honeywell, Inc. Board certified in internal medicine, Dr. Burns is the past president of the Ramsey County Medical Society.

He has been a second vice president of the MMA three times, is a former MMA delegate, and is a member of the AMA.

He has been active on MMA's Aging Committee, the Scientific Assembly, the Ad Hoc Committee on Temporary Disability Guidelines, and the Hemodialysis and Transplantation Committee which he chaired. Other MMA committees on which he has served include the Ad Hoc Committee on Death, the Local Arrangements and Site Selections Committees.

John E. Sutherland, M.D.

Dr. John E. Sutherland is a consultant in family medicine at the Mayo Clinic and a former chief of staff at North Memorial Medical Center in Robbinsdale and Louis Weiner Memorial Hospital in Marshall. His professional activities include service on nine committees of the Minnesota Academy of Family Physicians of which he is the current president. In 1977, he received the MAFP Merit Award for his contributions to family medicine.

Currently, he serves on the Executive Committee of Zumbro Valley Medical Society.

A board certified family physician, Dr. Sutherland has served on the MMA's Ad Hoc Committee on Health Care Cost Commission and is currently a member of the Communications Committee, the Interspecialty Council, and MINNPAC'S Board of Directors. He served on MMA's PPO Steering Committee and is a member of the Blue Cross Blue Shield Advisory Committee. He is a member of the AMA and has been a MMA delegate.

MMA Board of Trustees Reports 1983 AMA Delegate and Alternate Delegate Nominees

The MMA Board of Trustees submits the AMA Delegate and Alternate Delegate nominees whose profiles follow. The election will take place during the May 19, 1983 session of the MMA House of Delegates.

Because of membership growth, a sixth AMA Delegate and Alternate Delegate will be elected in 1983 to serve at the 1983 and 1984 AMA House of Delegates Meetings.

The Board adopted the following recommendation to the MMA House of Delegates on election procedure: (1) Vote on the three AMA Delegates for the terms commencing January 1, 1984. (2) Vote on the new 6th AMA Delegate. (3) Vote on the three AMA Alternate Delegates for the terms commencing January 1, 1984. (4) Vote on the new 6th AMA Alternate Delegate. Candidates for AMA Delegate who are unsuccessful may be nominated to run for AMA Alternate Delegate.

Nominations will be accepted from the floor of the House.

Delegates Whose Terms Will Commence January 1, 1984

Robert S. Flom, M.D.

Dr. Robert S. Flom is the current chairman of the Minnesota AMA delegation. He has served as an AMA Delegate since 1976. He was president of the MMA in 1978 and president of the Ramsey County Medical Society in 1974. Currently, he is the chairman of the Board of Directors of Minnesota Medical Management, Inc., and was past chairman of the Board of Governors of the Minnesota Medical Insurance Exchange, the physician owned *casualty insurance company*.

He has served on numerous MMA committees.

Board certified in surgery, Dr. Flom practices in St. Paul. Recently, he was named to the Payment Mechanisms Work Group, a component of the AMA Health Policy Agenda.

Richard J. Frey, M.D.

Dr. Richard J. Frey is a board certified internist practicing in Minneapolis. He was president of the Hennepin County Medical Society in 1966 and chairman of the MMA Board of Trustees from 1974 to 1979. He served on the MMA Board from 1967 to 1979.

He chaired both the MMA Commission on Health Care Costs and the Minnesota Coalition on Health Care Costs and served as an officer of the Foundation for Health Care Evaluation. Dr. Frey received the Shotwell Award in 1978 as well as the MMA Distinguished Service Award. He was elected an AMA Delegate in 1981.

John K. Meinert, M.D.

Dr. John K. Meinert is a board certified internist practicing in Willmar. In 1980, he was president of the MMA and in 1970 was president of the Kandiyohi-Swift-Meeker County Medical Society.

Dr. Meinert was first elected to the post of AMA Delegate in 1981. He has served on the MMA Board of Trustees, chaired numerous MMA committees, served on several committees, and is an associate editor of MINNESOTA MEDICINE.

TRUSTEE NOMINEES

Alternate Delegates Whose Terms Will Commence January 1, 1984

A. Stuart Hanson, M.D.

Dr. A. Stuart Hanson was elected an AMA Alternate Delegate in 1981. He is board certified in pulmonary diseases and internal medicine and practices in St. Louis Park and Minneapolis.

He served as chairman of the Physicians Metro Health Force and was appointed to the West Metro Trustees Council Issues Task Force. Dr. Hanson has served on numerous MMA committees including the Ad Hoc Committee on Health Care Competition and Regulation.

Ben P. Owens, M.D.

Dr. Ben P. Owens is a board certified family physician practicing in Hibbing. In 1982, Dr. Owens was named Minnesota's Family Physician of the Year by the Minnesota Academy of Family Physicians.

He has served as an AMA Alternate Delegate since 1980. Dr. Owens has served on numerous MMA committees and in the MMA House of Delegates. He has been active in the Range Medical Society and was elected its president in 1960.

Thomas G. Briggs, M.D.

Dr. Thomas G. Briggs is a board certified family physician practicing in White Bear Lake. Currently, Dr. Briggs is a member of the MMA Board of Trustees and chairman of the MMA Impaired Physicians Committee.

Dr. Briggs served as secretary of the MMA and as a member of the MMA Administration and Finance Committee as well as numerous other MMA committees. He is past president of the Ramsey County Medical Society.

New 6th AMA Delegate for 1983 and 1984

Severin H. Koop, Jr., M.D.

Dr. Severin H. Koop, Jr. is a board certified otolaryngologist practicing in St. Cloud. Currently, Dr. Koop is the president of the MMA. From 1978 to 1980, he was the speaker of the MMA House of Delegates and served as vice speaker from 1975 to 1978.

Dr. Koop was vice president of the MMA in 1973, and a member of numerous MMA committees. He has been active in the Stearns Benton County Medical Society and was president of the Minnesota Academy of Ophthalmology and Otolaryngology in 1975.

S. R. Maxeiner, Jr., M.D.

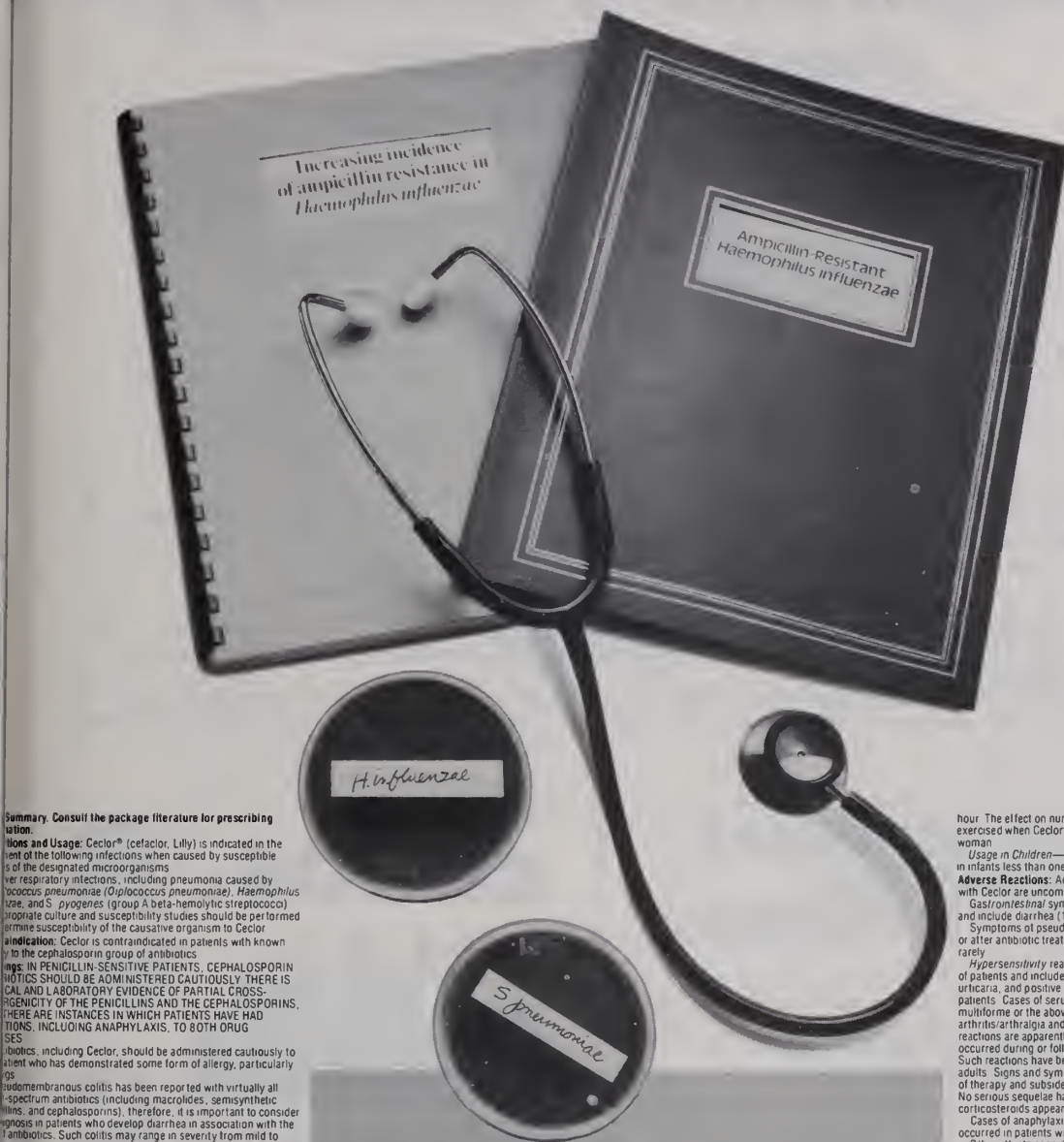
Dr. S. R. Maxeiner, Jr. is board certified in surgery practicing in Minneapolis. He is currently serving as the chairman of the Hennepin County Medical Society Board of Directors. Dr. Maxeiner was the president of HCMS in 1981.

He has served on numerous MMA committees including the Committee on Automotive Injuries and the Committee on Medical Services. Dr. Maxeiner is on the Board of Directors of the Hennepin County Medical Foundation and the United Way.

New 6th Alternate AMA Delegate

No candidates were nominated.

An added complication... in the treatment of bacterial bronchitis*



Summary: Consult the package literature for prescribing information.

Indications and Usage: Cefclor® (cefclor, Lilly) is indicated in the treatment of the following infections when caused by susceptible strains of the designated microorganisms:

Upper respiratory infections, including pneumonia caused by *Streptococcus pneumoniae* (*Diplococcus pneumoniae*), *Haemophilus influenzae*, and *S. pyogenes* (group A beta-hemolytic streptococci). Appropriate culture and susceptibility studies should be performed to determine susceptibility of the causative organism to Cefclor.

Contraindications: Cefclor is contraindicated in patients with known hypersensitivity to the cephalosporin group of antibiotics.

Warnings: IN PENICILLIN-SENSITIVE PATIENTS, CEPHALOSPORIN ANTIBIOTICS SHOULD BE ADMINISTERED CAUTIOUSLY. THERE IS CLINICAL AND LABORATORY EVIDENCE OF PARTIAL CROSS-REACTIVITY OF THE PENICILLINS AND THE CEPHALOSPORINS. THERE ARE INSTANCES IN WHICH PATIENTS HAVE HAD ALLERGIC REACTIONS, INCLUDING ANAPHYLAXIS, TO BOTH DRUGS.

Precautions: Antibiotics, including Cefclor, should be administered cautiously to patients who have demonstrated some form of allergy, particularly to penicillins. Pseudomembranous colitis has been reported with virtually all spectrum antibiotics (including macrolides, semisynthetic penicillins, and cephalosporins); therefore, it is important to consider this possibility in patients who develop diarrhea in association with the use of antibiotics. Such colitis may range in severity from mild to severe.

Concomitant use of broad-spectrum antibiotics alters the normal flora of the colon and may permit overgrowth of clostridia. Studies indicate that a toxin produced by *Clostridium difficile* is one primary cause of antibiotic-associated colitis. Mild cases of pseudomembranous colitis usually respond to drug discontinuance alone. In moderate to severe cases, management should include sigmoidoscopy, appropriate bacteriologic studies, and electrolyte and protein supplementation. When the colitis does not improve after the drug has been discontinued, or when it is severe, oral vancomycin is the drug of choice for antibiotic-associated pseudomembranous colitis produced by *C. difficile*. Other causes of colitis should be ruled out.

Adverse Effects: General Precautions—If an allergic reaction to Cefclor occurs, the drug should be discontinued, and, if necessary, the patient should be treated with appropriate agents, e.g., pressor amines, antihistamines, or corticosteroids. Prolonged use of Cefclor may result in the overgrowth of susceptible organisms. Careful observation of the patient is essential. If superinfection occurs during therapy, appropriate measures should be taken.

Diagnostic Tests: False-positive Coombs' tests have been reported during treatment with cephalosporin antibiotics. In hematologic studies, the cephalosporin fusion cross-matching procedures when antiglobulin tests are performed on the minor side or in Coombs' testing of newborns' mothers have received cephalosporin antibiotics before birth, it should be recognized that a positive Coombs' test may be due to the drug.

Use in Pregnancy: Pregnancy Category B—Reproduction studies have been performed in mice and rats at doses up to 12 times the human dose and in fetuses given three times the maximum human dose and have revealed no evidence of impaired fertility or harm to the fetus due to Cefclor. There are, however, no adequate and controlled studies in pregnant women. Because animal reproduction studies are not always predictive of human response, this drug should be used during pregnancy only if clearly needed.

Some ampicillin-resistant strains of *Haemophilus influenzae*—a recognized complication of bacterial bronchitis*—are sensitive to treatment with Cefclor.¹⁻⁶

In clinical trials, patients with bacterial bronchitis due to susceptible strains of *Streptococcus pneumoniae*, *H. influenzae*, *S. pyogenes* (group A beta-hemolytic streptococci), or multiple organisms achieved a satisfactory clinical response with Cefclor.⁷

Cefclor®

cefclor

Pulvules®, 250 and 500 mg

hour. The effect on nursing infants is not known. Caution should be exercised when Cefclor® (cefclor, Lilly) is administered to a nursing woman.

Usage in Children: Safety and effectiveness of this product for use in infants less than one month of age have not been established.

Adverse Reactions: Adverse effects considered related to therapy with Cefclor are uncommon and are listed below.

Gastrointestinal symptoms occur in about 2.5 percent of patients and include diarrhea (1 in 70).

Symptoms of pseudomembranous colitis may appear either during or after antibiotic treatment. Nausea and vomiting have been reported rarely.

Hypersensitivity reactions have been reported in about 1.5 percent of patients and include morbilliform eruptions (1 in 100). Pruritus, urticaria, and positive Coombs' tests each occur in less than 1 in 200 patients. Cases of serum-sickness-like reactions (erythema multiforme or the above skin manifestations accompanied by arthritis/arthritis and, frequently, fever) have been reported. These reactions are apparently due to hypersensitivity and have usually occurred during or following a second course of therapy with Cefclor. Such reactions have been reported more frequently in children than in adults. Signs and symptoms usually occur a few days after initiation of therapy and subside within a few days after cessation of therapy. No serious sequelae have been reported. Antihistamines and corticosteroids appear to enhance resolution of the syndrome.

Cases of anaphylaxis have been reported, half of which have occurred in patients with a history of penicillin allergy.

Other effects considered related to therapy included eosinophilia (1 in 50 patients) and genital pruritus or vaginitis (less than 1 in 100 patients).

Causal Relationship Uncertain: Transitory abnormalities in clinical laboratory test results have been reported. Although they were of uncertain etiology, they are listed below to serve as alerting information for the physician.

Hepatic: Slight elevations of SGOT, SGPT, or alkaline phosphatase values (1 in 40).

Hematologic: Transient fluctuations in leukocyte count, predominantly lymphocytosis occurring in infants and young children (1 in 40).

Renal: Slight elevations in BUN or serum creatinine (less than 1 in 500) or abnormal urinalysis (less than 1 in 200).

(061782R)

*Many authorities attribute acute infectious exacerbation of chronic bronchitis to either *S. pneumoniae* or *H. influenzae*.

Note: Cefclor is contraindicated in patients with known allergy to the cephalosporins and should be given cautiously to penicillin-allergic patients.

Penicillin is the usual drug of choice in the treatment and prevention of streptococcal infections, including the prophylaxis of rheumatic fever. See prescribing information.

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Additional information available to the profession on request from Eli Lilly and Company, Indianapolis, Indiana 46285. Eli Lilly Industries, Inc., Carolina, Puerto Rico 00630.

Respiratory therapy should not end with her dismissal.

Changes will occur in the patient's condition between dismissal from the hospital and the next scheduled check-up - changes so subtle as to go unnoticed by other than a trained professional.

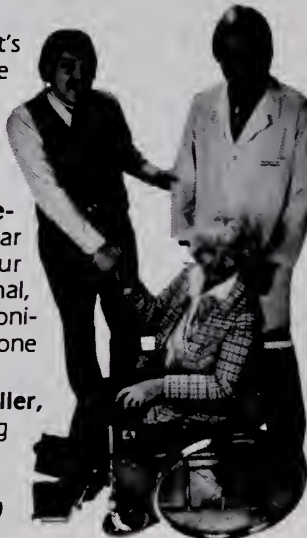
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We help the patient breathe easier.

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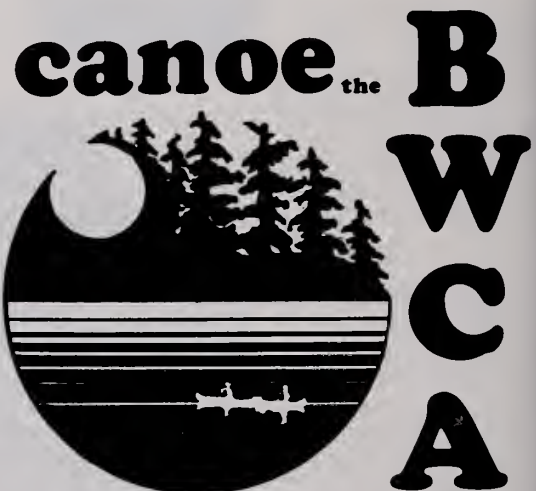
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Echoes from Our Past

A Mixed Bag

JACK D. KEY, M.A., M.S.*

Have you ever had problems with books disappearing from your personal library? Here's an example of a curse which might help keep your collection intact.

FOR HIM THAT STEALETH, OR BORROWETH AND RETURNETH NOT,
THIS BOOK FROM ITS OWNER, LET IT CHANGE TO A SERPENT IN HIS
HAND AND STING HIM. LET BOOKWORMS GNAW AT HIS ENTRAILS IN
TOKEN OF THE WORM THAT DIETH NOT, AND WHEN AT LAST HE
GOETH TO HIS END, LET THE FLAME OF HELL COMSUME HIM
FOREVER AND AYE.

— from a Seventeenth-Century Book Plate

* * * * *

The Marquis of Ourches has left, by his will, two sums, one of £ 800 and the other of £ 200, to be awarded, by the Academy of Medicine of Paris, to the person who shall discover the means of ascertaining, without the slightest doubt, whether presumed death is real or apparent.¹

* * * * *

Dr. Hutton, of the Long Island College Hospital, states that, as far as his experience goes, the following rule may be relied upon: "Foetal pulsations heard below a horizontal line dividing the uterus into two equal parts denote vertex presentation, and above it breach presentation. Below this line and to the left denotes the first position, to the right the second position. When the pulsations number 144 per minute it is a female, and when 124 it is a male. A variation of six beats per minute from 124 upward, or from 144 downward, will not endanger the diagnosis, provided auscultation be practiced in the ninth month of pregnancy."²

* * * * *

Vinum Millepedum, Hog-lice Wine.

Take hog-lice, half a pound, put them alive into two pounds of white port wine, and after some days infusion strain and press out very hard; then put in saffron two drachms, salt of steel one drachm, and salt of amber two scruples, and after three or four days strain and filter for use. This is an admirable medicine against the jaundice, dropsy or any cachectic habit. It greatly deterges all the viscera, and throws off a great deal of superfluous humors by urine. It may be given twice a day, two ounces at a time.³

* * * * *

Dr. E. L. Keyes is said to have received \$60,000, as a professional fee from Mr. Vanderbilt, for accompanying him on a four months' yacht excursion.⁴

* * * * *

May 6th 1894

Dear Sar

I will write and tell you how he is he is gust the same and his stomick bloth up and is so hard that he thing that it is gunt buts he is sick over his hole body and it sits up on under his brist but he is gut good opening in frunt and behind.⁵

*Librarian, Mayo Clinic, Rochester Minnesota.

References

1. Medical News. Lancet 2:410, 1867.
2. Notes, Queries, and Replies. Medical Times and Gazette 2:216, 1872.
3. Notes and Comments (taken from Pharmacopoeia Officialis and Extemporanea; or, A Complete English Dispensatory. London, 1741). Medical & Surgical Reporter 58:93, 1888.
4. Maritime Medical News 6:410, 1894.
5. Northwestern Lancet 14:215, 1894.

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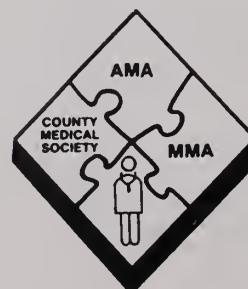
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Minnesota Medical Association 1983 Annual Meeting

Wednesday-Friday, May 18-20, Radisson South Hotel, Bloomington

SCIENTIFIC PROGRAM

THURSDAY, MAY 19, 1983

Plenary Session—Title and Speakers

8:30 a.m. — 9:30 a.m.

DECISION MAKING: CORONARY ARTERY DISEASE — 1983

John A. Spittell, Jr., M.D., Rochester, Moderator
Robert L. Frye, M.D., Rochester
Raymond J. Gibbons, M.D., Rochester
Fredarick L. Gobel, M.D., Minneapolis

Breakout Sessions—Titles and Course Directors

9:45 a.m. — 11:45 a.m. (concurrent sessions)

A. QUESTION AND ANSWER SESSION ON DECISION MAKING: CORONARY ARTERY DISEASE — 1983

B. EVERYDAY ETHICS

Alvin L. Schultz, M.D., Minneapolis

C. BIOTECHNOLOGICAL MEDICINE AND CLINICAL IMPLICATIONS

Karen N. Olness, M.D., Minneapolis

NEUROPEPTIDES

John E. Morley, M.D., Minneapolis

RECOMBINANT DNA TECHNOLOGY

David R. Brown, M.D., Minneapolis

D. HOW TO MANAGE COMMON RHEUMATOLOGIC PROBLEMS

Roger S. Colton, M.D., St. Paul

1:30 p.m. — 4:30 p.m. (concurrent sessions)

*E. FIBERGLASS CASTS: APPLICATION TECHNIQUES

John A. Wilson, M.D., Minneapolis

*F. COMPUTERS IN YOUR LIFE: A HANDS ON EXPERIENCE

Carlton R. Erickson, M.D., Lindstrom

G. FARM AND RURAL MEDICINE

Paul B. Johnson, M.D., St. Paul

H. HEALTH PROBLEMS OF MINNESOTANS

"Doing Prevention in Office Practice Without Going Broke"

Andrew G. Dean, M.D., Minneapolis

I. INFECTIOUS DISEASES FOR THE PRIMARY CARE PHYSICIAN

Charles W. Drage, M.D., St. Paul

*Includes hands-on demonstration; limited attendance

FRIDAY, MAY 20, 1983

Plenary Session—Title and Speakers

8:30 a.m. — 9:30 a.m.

PSYCHIATRIC PROBLEMS OF PHYSICIANS AND THEIR FAMILIES**

Karen N. Olness, M.D., Minneapolis, Moderator
M. J. Martin, M.D., Rochester

Breakout Sessions—Titles and Course Directors

9:45 a.m. — 11:45 a.m. (concurrent sessions)

J. PARENTING YOUNG

CHILDREN/ADOLESCENTS**

Marilyn R. Campbell, M.D., Coon Rapids, Moderator

Marvin Ack, Ph.D., Minneapolis

Elizabeth B. Jerome, M.D., Minneapolis

K. PHYSICIANS, FAMILIES AND DRUG ABUSE**

Samuel W. Hall, Jr., M.D., St. Paul

L. COPING WITH STRESS**

Harley J. Racer, M.D., Minneapolis

M. PROGRESSIVE DEMENTIA: PRE-SENILE AND SENILE

Lawrence J. Schut, M.D., Minneapolis

11:15 a.m. — 5:15 p.m.

*N. CARDIOPULMONARY RESUSCITATION (CPR)

Harold Panuska, D.D.S., Minneapolis

Plenary Session—Title and Speaker

1:30 p.m. — 3:00 p.m.

NEWER IMAGING TECHNIQUES: CT, DIGITAL ANGIOGRAPHY, NUCLEAR MAGNETIC RESONANCE

Glenn Forbes, M.D., Rochester

Breakout Sessions—Titles and Course Directors

3:15 p.m. — 4:45 p.m. (concurrent sessions)

O. RADIOLOGY WORKSHOP: AN APPROACH TO SPINAL TRAUMA

Thomas H. Berquist, M.D., Rochester

P. PRACTICAL EVALUATION OF PEDIATRIC X-RAYS

Shashikant M. Sane, M.D., Minneapolis

Q. CLINICAL TOXICOLOGY WORKSHOP

Kusum Saxena, M.D., St. Paul

**Spouse participation encouraged

OTHER ACTIVITIES:

President's Reception and Banquet
Physicians' Art Show
Scientific and Technical Exhibits
Specialty Society Meetings
Luncheon for Women Physicians
MMA House of Delegates
Luncheon for International Health Volunteers

FEES:

MMA Members:

\$35.00 for one half-day session
\$45.00 for two half-day sessions
\$55.00 for three half-day sessions
\$65.00 for four half-day sessions

Non-Members—Double the regular rate (above)

Reduced rates for medical students, residents and spouses

ACCREDITATION:

As an organization accredited for continuing medical education, the Minnesota Medical Association verifies that these continuing medical education activities meet the criteria for credit on an hour-for-hour basis in Category 1 for the Physician's Recognition Award of the AMA and for the relicensure requirements of the Minnesota State Board of Medical Examiners.

This program has been reviewed and found acceptable for the Prescribed credit on an hour-for-hour basis by the American Academy of Family Physicians.

FOR FURTHER INFORMATION CALL OR WRITE:

Eugenia Kassir
Department of Education and Specialty Affairs
Minnesota Medical Association
2221 University Avenue S.E., Suite 400
Minneapolis, Minnesota 55414
612/378-1875

1983 ANNUAL MEETING REGISTRATION FORM

Please print:

Name _____
 Address _____
 City _____ State _____ Zip _____
 Specialty _____ Office Phone (____) _____

Please check your appropriate slot(s):

☐ MMA Member ☐ Practicing/Retired Physician
☐ Non-Member ☐ Resident
☐ AMA Member ☐ Medical Student
☐ MINNPAC Member ☐ Spouse
 ☐ Allied Health
 (please specify: _____)

Scientific Program—Thursday, May 19 and Friday, May 20

For each half-day segment you plan to attend, please indicate the letter of your preferred breakout session in the blank provided. If you wish to register for the CPR session (N) on Friday, check that blank but do not register for a breakout session on Friday morning or afternoon.

☐ Thursday morning (A-D) includes plenary (worth one ½ day)
☐ Thursday afternoon (E-I) breakout only (worth one ½ day)
☐ Friday all day (N) includes morning plenary (worth two ½ days)

OR

☐ Friday morning (J-M) includes plenary (worth one ½ day)
☐ Friday afternoon (O-Q) includes plenary (worth one ½ day)

Please circle your appropriate cost category and enclose your payment:

	Cost/ one ½ day	Cost/ two ½ days	Cost/ three ½ days	Cost/ four ½ days
Practicing/Retired physician-MMA Member	\$35	\$45	\$ 55	\$ 65
Practicing/Retired physician-Non-Member	\$70	\$90	\$110	\$130
Spouse of a MMA Member who is registered	FREE	FREE	FREE	FREE
Spouse of a Non-Member who is registered	FREE	FREE	FREE	FREE
Spouse of a MMA Member—NOT registered	\$35	\$45	\$ 55	\$ 65
Spouse of a Non-Member—NOT registered	\$70	\$90	\$110	\$130
Resident physician—MMA Member	FREE	FREE	FREE	FREE
Resident physician—Non-Member	\$10**	\$10**	\$10**	\$10**
**this \$10 fee may be credited to 1983 MMA membership dues if you apply to and are accepted by your county society.				
Medical Student—MMA Member OR Non-Member	FREE	FREE	FREE	FREE
Faculty, MMA 1983 Scientific Program	FREE	FREE	FREE	FREE
Sponsored Non-Member Physician (one-time option only)	FREE	FREE	FREE	FREE

Print sponsor's name _____

Signature of Sponsor (MMA Member) _____

Delegates' Luncheon—Wednesday, May 18

Please send me _____ ticket(s) @ \$6.50 each. Enclosed is my payment of \$_____.

President's Reception and Banquet—Thursday, May 19

Please send me _____ ticket(s) @ \$30.00 each. Enclosed is my payment of \$_____.

Other Special Events

Please send me information on the following:

☐ Physicians' Art Show ☐ Environmental Health Program
☐ Financial Planning Seminar ☐ Child Care Services

Deadline: Registration forms will be processed by the MMA Office up to and including those received on **May 10, 1983**. After that date, registrations will be accepted **on-site** on a **space available basis**.

Please make checks payable to: **MINNESOTA MEDICAL ASSOCIATION**

Return this form to: Eugenia Kassar
 Minnesota Medical Association
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Minnesota Medical Association

CME in Minnesota

Provided through the Medical Education Subcommittee on CME Resources

For assistance with scheduling meetings, please contact the MMA office (address and phone given below) for information on future medical meetings and CME courses at the state and national level.

Information for each entry is arranged as follows: Date: Name of program; Primary sponsor; Location; Contact person.

April, 1983

13-15 Annual Spring Refresher; **Minnesota Academy of Family Physicians**; Radisson South, Bloomington; CONTACT: Chari Konerza, MN Academy of Family Physicians, 2221 Univ. Ave. SE, Suite 426, Minneapolis, MN 55414, 612/623-9559.

14-15 **Pediatric Days**; American Academy of Pediatrics, MN Chapter; Rochester; CONTACT: Tony Smithson, Mayo Clinic, E 9A, Rochester, MN 55905, 507/284-2511.

16 Spring Meeting; **Minnesota Society of Anesthesiologists**; CONTACT: David E. Byer, M.D., 200 1st St. S.W., Rochester, MN 55901

16 **Management of Diabetes Mellitus — 1983**; Mount Sinai Hospital; Mpls.; CONTACT: Evelyn Peterson, Mount Sinai Hospital, 2215 Park Avenue, Mpls., MN 55404, 612/871-3700 Ext. 1117.

21-23 **Allergy and Immunology**; U of M Medical School; Mayo Memorial Auditorium, Minneapolis; CONTACT: CME, U of M, Box 293, Mayo Memorial Bldg., 420 Delaware St. SE, Minneapolis, MN 55455, 612/373-8012.

22 **11th Annual Pediatric Challenges for Primary Care Physicians**; Mpls. Children's Health Center; MCHC; CONTACT: James Moore, M.D., Indian Health Board, 2495 — 18th Ave. So., Minneapolis, MN 55404, 612/721-7425.

23 Spring Meeting; **Minnesota Urological Society**; Minneapolis; CONTACT: Robert P. Myers, M.D., Dept. of Urology E 17A, Mayo Clinic, Rochester, MN 55905.

23 CME Meeting, **Minnesota Psychiatric Society**; Mpls.; CONTACT: Patricia Rowe, 1770 Colvin Ave., St. Paul, MN 55116, 612/698-1971.

25-26 **Vitreo-Retinal Disease**; U of M Medical School; Holiday Inn, Minneapolis; CONTACT: CME, U of M, Box 293, Mayo Memorial Bldg., 420 Delaware St. SE, Minneapolis, MN 55455, 612/373-8012.

26-27 **Accreditation Seminar for Psychiatric Substance Abuse Facilities**; Minnesota Hospital Association, Mpls.; CONTACT: Heidi Simpson, MN Hospital Association, 2221 University Ave. S.E., Mpls., MN 612/331/5571.

28-30 **Current Trends in Audiology**; Mayo Clinic; Rochester; CONTACT: Mayo Clinic, 200 1st St. SW, Rochester, MN 55905, 507/284-2085.

29 Semi-Annual Meeting, **Minnesota Surgical Society**; Duluth; CONTACT: Charles L. Barbee, M.D., 1000 E. 1st St., Suite 203, Duluth, MN 55805, 218/727-7259.

29-30 **Disability Evaluation**; U of M; Mpls.; CONTACT: CME, U of M, Box 293 Mayo Memorial Bldg., 420 Delaware St. S.E., Minneapolis, MN 55455, 612/373-8012.

30 Semi-Annual Meeting of the **MN Society of Internal Medicine**; St. Paul-Ramsey Minnesota; CONTACT: C. A. Pierach, M.D., Secretary-Treasurer, MN Society of Internal Medicine, Abbott-Northwestern Hospital, Minneapolis, MN 55407.

30 Spring Meeting — **MN Society of Clinical Pathologists**; Minnesota Club, St. Paul, MN; CONTACT: Eugenia C. Kassir, MSCP, 2221 University Avenue S.E., Suite 400, Minneapolis, MN 55414; 612/378-1875.

May, 1983

2-6 **Family Practice Review and Update**; U of M Medical School; Radisson Hotel, St. Paul; CONTACT: CME, U of M, Box 293, Mayo Memorial Bldg., 420 Delaware St. SE, Mpls., MN 55455, 612/373-8012.

2-6 **Practice of Internal Medicine — 1983**; Mayo Clinic, Rochester; CONTACT: Mayo Clinic, 200 1st St. SW, Rochester, MN 55905, 507/284-2085.

4 **Annual Willmar Medical Center Spring Symposium**; Willmar Medical Center, Willmar, MN; CONTACT: Robert M. Kaiser, M.D., 101 Willmar Avenue, Willmar, MN 56201; 612/231-5000.

6-7 **Wellness and Sports Medicine**; St. Louis Park Medical Center Research Foundation; Radisson South, Edina, MN; CONTACT: Elaine Anderson, Assistant Director of Medical Education, 5000 West 39th Street, Minneapolis, MN 55416; 612/927-3703.

7 **Annual Hospital-Wide Research Conference**; St. Paul-Ramsey Medical Center; Sheraton Midway, St. Paul; CONTACT: Ruth McIntyre, St. Paul-Ramsey Medical Center, 640 Jackson Street, St. Paul, MN 55101; 612/221-3992.

12 **Medicine**; St. Joseph's Hospital; St. Joseph's Hospital; CONTACT: M. A. Muesing, M.D., 303 Kingwood, Brainerd, MN 56401, 218/829-3568.

12-21 **Advanced Cardiac Life Support Course**; Methodist Hospital; Methodist Hospital; CONTACT: Joan Peterson, R.N., Methodist Hospital, 6500 Excelsior Blvd., P.O. Box 650, Mpls., MN 55440, 612/932-5419.

13 Quarterly Clinical Meeting; **Minnesota Dermatological Society**, Minneapolis; CONTACT: J. Corwin Vance, M.D., Dept. of Dermatology, HCMC, 701 Park Ave. S., Minneapolis, MN 55415.

May (Continued)

13 American Heart Association — MN Affiliate, Annual Meeting and Scientific Sessions; American Heart Association, MN Affiliation; Kahler Hotel, Rochester, MN; CONTACT: Michael Osborn, M.D., Mayo Clinic, Rochester, MN 55901; 507/282-2511.

13-14 Ophthalmic Reviews; Mayo Clinic; Rochester; CONTACT: Mayo Clinic, 200 1st St. SW, Rochester, MN 55905, 507/284-2085.

13-15 State-of-the-Art in Clinical Anesthesiology; Rochester; CONTACT: David E. Byer, M.D., 200 1st St. SW, Rochester, MN 55905, 507/286-8701.

16-17 Topics and Advances in Pediatrics; U of M Medical School; Location undetermined; CONTACT: CME, U of M, Box 293, Mayo Memorial Bldg., 420 Delaware St. SE, Minneapolis, MN 55455, 612/373-8012.

18-20 Bone and Soft Tissue Tumor Course; Mayo Clinic; Rochester; CONTACT: Mayo Clinic, 200 1st St. SW, Rochester, MN 55905, 507/284-2085.

19-20 1983 Scientific Program; Minnesota Medical Association; Minneapolis; CONTACT: Eugenia C. Kassir, Minnesota Medical Association, 2221 University Ave. SE, Suite 400, Minneapolis, MN 55414, 612/378-1875.

23-24 Basic Life Support Course; Methodist Hospital, Methodist Hospital; CONTACT: Janell Haugen, Methodist Hospital, 6500 Excelsior Blvd., P.O. Box 650, Mpls., MN 55440, 612/932-5189.

23-24 Congenital Heart Disease; U of M; Mpls.; CONTACT: CME, U of M, Box 293 Mayo Memorial Bldg., 420 Delaware St. SE, Mpls., MN 55455, 612/373-8012.

25-27 Real Time Ultrasound in Ob-Gyn; U of M; Mpls.; CONTACT: CME, U of M, Box 293 Mayo Memorial Bldg., 420 Delaware St. S.E., Minneapolis, MN 55455, 612/373-8012.

25-27 Current Concepts in Radiation Therapy; U of M; Minneapolis; CONTACT: CME, U of M, Box 293 Mayo Memorial Bldg., 420 Delaware St. S.E., Minneapolis, MN, 55455, 612/373-8012.

29-June 11 Dutch Waterways Adventure; North Central Medical Conference; CME included; CONTACT: Betty Schmid, North Central Medical Conference, 2221 Univ. Ave. S.E., Suite 400, Minneapolis, MN 55414, 612/378-1875.

June, 1983

3-5 Annual Meeting; Minnesota Thoracic Society; Madden Lodge, Brainerd; CONTACT: Fred Rasp, M.D., 606 24th Ave. So., Suite 119, Minneapolis, MN 55454, 612/333-2156.

9-10 The Science of Marathon Running; Duluth School of Medicine; Duluth; CONTACT: Lynn Delvin, UMD School of Medicine, 2400 Oakland Ave., Duluth, MN 55812, 218/726-7581.

9-11 Interdisciplinary Approach to the Treatment of the Critically Ill Patient; St. Paul-Ramsey Medical Center; St. Paul Hotel; CONTACT: Ruth McIntyre, St. Paul-Ramsey Medical Center, 640 Jackson St., St. Paul, MN 55101, 612/221-3992.

10-11 Clinical Hypnosis; Earle Brown Center; St. Paul; CONTACT: CME, U of M, Box 293 Mayo Memorial Bldg., 420 Delaware St. SE, Mpls., MN 55455, 612/373-8012.

10-11 Annual Meeting; Minnesota Obstetrical & Gynecological Society; Barker's Island, Superior, Wisconsin; CONTACT: Mrs. Cammy Kelley or Dr. Carolyn B. Coulam, Mayo Clinic, 200 1st St. SW, Rochester, MN 55905.

14, 21, 22 Basic Life Support Instructor Program; Methodist Hospital, Methodist Hospital; CONTACT: Mary Ann Kempcke, Methodist Hospital, 6500 Excelsior Blvd., P.O. Box 650, Mpls., MN 55440, 612/932-5167.

15-18 G.I. Surgery; U of M Medical School; Willey Hall West Bank, U of M, Mpls.; CONTACT: CME, U of M, Box 293, Mayo Memorial Bldg., 420 Delaware St. SE, Mpls., MN 55455, 612/373-8012.

19-24 Laryngectomy Rehabilitation Seminar; Mayo Clinic, Rochester; CONTACT: Postgraduate Courses, Mayo Clinic, 200 1st St. S.W., Rochester, MN 55905; 507/284-2075.

23-25 Behavioral Pediatrics; U of M Medical School; U of M, St. Paul; CONTACT: CME, U of M, Box 293, Mayo Memorial Bldg., 420 Delaware St. SE, Mpls., MN 55455, 612/373-8012.

29-30 Human Aging VI; U of M; Mayo or Willey Hall, U of M; CONTACT: CME, U of M, Box 293 Mayo Memorial Bldg., 420 Delaware Street S.E., Mpls, MN 55455 612/373-8012.

30 Neonatal Resuscitation; North Memorial Medical Center; CONTACT: Martin Weems, M.D., 3300 Oakdale No., Robbinsdale, MN 55422; 612/520-5200

July, 1983

8-9 Women in Medicine Symposium; U of M Earle Brown Center, St. Paul; CONTACT: CME, U of M, Box 293 Mayo Memorial Bldg., 420 Delaware St. S.E., Minneapolis, MN 55455; 612/373-8012.

8-21 Orient-Express Adventure; North Central Medical Conference; CONTACT: Betty Schmid, North Central Medical Conference, 2221 University Ave. S.E., Suite 400, Minneapolis, MN 55414; 612/378-1875.

July 22-August 3 Main River Adventure, North Central Medical Conference; CONTACT: North Central Medical Conference, 2221 University Ave. S.E., Suite 400, Minneapolis, MN 55414; 612/378-1875.

July 28-30 Orthopaedic Surgery: Hip Replacement; U of M; Hyatt Regency Hotel, Nicollet Mall, Minneapolis, MN CONTACT: CME, U of M, Box 293 Mayo Memorial Bldg., 420 Delaware St. S.E., Minneapolis, MN 55455; 612/373/8012.

For further information on *future* CME programs, contact Department of Education & Specialty Affairs, Minnesota Medical Association, 2221 University Ave. SE, Suite 400, Minneapolis, MN 55414, 612/378-1875.

MINNESOTA MEDICAL INSURANCE EXCHANGE: MALPRACTICE CLAIMS CONTROL

MMIE Risk Management Committee

Frank E. Johnson, M.D., Chairman

Maintaining Defensible Medical Records: The Physician's Office Chart

There is no universally recommended standard format for maintaining office medical records. The office chart should be designed to meet the needs and personal style of individual doctors. Consistency in charting is crucial, however, for inconsistent entries or charting practices may handicap the defense of a malpractice lawsuit:

Dr. "Smith," a family physician, was sued for an alleged failure to diagnose breast cancer. A 42 year-old patient had complained of a lump in her left breast. The office chart note read: "Lump L. breast. Benign?" The patient returned in three months for an unrelated complaint. The office note included the comment, "L. breast lump about same. Watch." Dr. Smith saw the patient six times during the next 11 months for general medical problems. None of his notes on these visits mentioned the breast lump. Two months after her last visit, the patient was seen by a surgeon, who recommended a biopsy of the breast lump. The diagnosis was of an inoperable malignancy. The patient sued Dr. Smith alleging that the lump continued to grow, that Dr. Smith failed to evaluate this change and missed the diagnosis. Dr. Smith argued in his defense that the lump remain unchanged during the 12 months he treated the patient. At trial, the patient's attorney used Dr. Smith's own records to convince a jury that the physician had not examined the breast after the second visit. The absence of a follow-up note about a significant finding such as a breast lump, the attorney argued, is evidence that the breast was not examined. The jury awarded the patient \$450,000.

Consistency is also important in the records of group practices, where more than one physician may treat the same patient. Not only may incomplete or inaccurate chart entries lead to errors by colleagues relying on the record, but, in a malpractice action,

the plaintiff's attorney will examine the record carefully for inconsistencies that could explain an adverse result of treatment.

The contents of medical records may also vary, depending on the charting practices of particular physicians. In addition to the usual entries (e.g., history, allergies, present complaints, clinical findings, and lab reports), the following entries will help maintain a complete record of the patient's treatment, as well as provide a solid foundation for the defense of a malpractice lawsuit:

CANCELLED AND FAILED APPOINTMENTS: Patients often are injured as the result of their own carelessness in following medical advice. A documented pattern of inattention to scheduled appointments has helped defend many physicians against unmeritorious claims.

RETURN VISIT DATE: This note protects the physician against the negligent patient who fails to return as advised, and then claims he was not told to return.

PRESCRIPTIONS AND REFILLS: Prescriptions and refills for medications, including the name, dosage, and amount of each, should be documented in the chart. Refills phoned to the pharmacy by an aide should include the aide's initials, and the initials of the pharmacist accepting the order.

PHONE CONVERSATIONS: Physicians should document the substance of telephone conversations with patients in which advice is given or drug refills are authorized. A large number of malpractice suits center on disputes between patients and physicians about what was said in a phone conversation.

Office notes also should include the physician's recommendations for hospitalization, surgery, or referral to a specialist, and a patient's failure to follow instructions or recommendations.

- - -

Articles in this series are not legal advice. Readers should obtain specific legal advice from a qualified attorney.

Classified Advertisements

Classified advertising rates are forty (40) cents a word; minimum monthly charge \$10.00, key number, \$2.00 additional. Replies to advertisements with key numbers should be mailed in care of Minnesota Medicine, 2221 University Ave. S.E., #400, Minneapolis 55414.

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The Journal is not permitted to divulge the identity of advertisers who have replies sent to box numbers.

PEDIATRICIAN — BC/BE to join a 12 doctor multi-specialty group, southern Minnesota community of 12,000 (Trade area 70,000). Fairmont is a progressive city with excellent schools and recreational areas around a chain of five lakes. First year salary guaranteed with full partnership after one year. Contact Don Grandgenett, Administrator, Fairmont Medical Clinic, P.A., Fairmont, MN 56031. (507) 238-4263.

GENERAL SURGEON AND/OR OB/GYN SURGEON to join 10 doctor multi-specialty group in Owatonna, a community of 18,500 located 68 miles south of the Twin Cities and 42 west of Rochester. Present staff consists of 7 family practitioners, 2 internists, and 1 general surgeon. Other specialties in the community and a close working relationship with the Mayo Clinic, the University of Minnesota hospitals, and other metropolitan centers provide for excellent consultations. Guaranteed salary first year with incentive program thereafter. Group Health, disability, life and accident insurance, retirement profit sharing, and automobiles provided by corporation. Contact: J. D. Miller, M.D. or James Wilkus, Administrator, Owatonna Clinic, P.A., 134 Southview, Owatonna, MN 55060. Telephone (507) 451-1120.

WANTED: FAMILY PHYSICIAN, Board certified or eligible, to help solo physician in South Minneapolis do full time family practice. First year salary leading to full partnership. Part time work available. Write: Minnesota Medicine-727 2221 University Avenue So. E. #400, Minneapolis, MN 55414.

EXCELLENT OPPORTUNITY for two or three family practitioners in stable economic community serving 15,000 pop. Clinic facilities attached to accredited hospital. No investment required, starting income guaranteed. Contact Dr. W. P. Apostol, 507-629-4840 or Omer Eischens, Administrator, Tracy Municipal Hospital, Tracy, MN. 507-629-3200.

DOCTORS NEEDED in Wisconsin and Minnesota, all specialties, all locations. For confidential information, mail your C.V. to Medicus, W62 N281 Washington Avenue, Cedarburg, Wisconsin 53012.

OPENINGS NOW AVAILABLE in Family Practice, OB-GYN, and Orthopedics. The Albert Lea Medical & Surgical Center, Ltd. is actively recruiting for the above positions to be filled hopefully by July-August 1983. We are an eighteen man multi specialty group with excellent benefits. Full participation after the first year. No accounts receivable buy in; incentive income plan; full and complete medical and life insurance coverage; excellent pension profit sharing program. We are recruiting family practitioners for near by satellite clinics. All moving costs assumed by the clinic. Contact G. C. Wilcox, M.D. at clinic (507) 373-1441 or at home (507) 373-6974, or the Clinic Administrator C. C. Lowery at clinic (above), or at home (507) 373-8083.

FAMILY PHYSICIAN FOR PROGRESSIVE RURAL MINNESOTA CLINIC. New and superbly-equipped facility. A pleasant farming community in a physician shortage area, yet only 25 minutes from a metro area. A comfortable call schedule at nearby hospital. Gateway to Minnesota's famous lake country. Young and growing practice with excellent salary and benefits, ownership potential. Must be board-eligible. Call or write to Mr. David A. Nelson or Faris Keeling, M.D. at 218-354-2111 or write to Barnesville Area Clinic, P.O. Box 521, Barnesville, MN 56514.

FAMILY PHYSICIAN to join well established primary care practice. Newly remodeled clinic attached to modern hospital. First year guaranteed plus benefits. Contact Dr. Larry Rapp, Medical Arts Clinic, Elbow Lake, Mn. 218-685-4406 or Russell Sauer — 218-685-5272.

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FAMILY PRACTITIONER — Immediate need to associate with busy, Board Certified General Practitioner in Tomah, Wisconsin. Modern clinic, 57-bed local hospital, and formal association with 52-physician multispecialty clinic in La Crosse, WI. Tomah is an active, growing community of 7,000 with a medical service area of 20,000. Contact: P. S. Shultz, M.D., Medical Director, Skemp-Grandview-La Crosse Clinic, 815 S. 10th St., La Crosse, WI 54601. Phone (608) 782-9760.

CARDIOLOGY, DERMATOLOGY, GENERAL SURGERY, OPHTHALMOLOGY, ORTHOPEDIC SURGERY: Associate with 170 physicians providing comprehensive medical care to a patient population of 196,000 in one of America's leading metropolitan areas. Excellent facilities, competitive earnings and benefits. Contact: Paul Brat, M.D., Medical Director, *Group Health Plan, Inc.*, 2829 University Avenue Southeast, Minneapolis, Minnesota 55414. An equal opportunity employer.

NEUROLOGIST Board certified/eligible for 45 physician multi-specialty group in rural Minnesota with large referral area. CT Scan (GE8800) in community hospital. Large local state hospital would welcome consultations. Stimulating professional opportunities along with good family living — excellent schools — many lakes. Liberal salary and fringe benefits. Interested contact Ronald Holmgren, M.D., Willmar Medical Center, Willmar, MN 56201.

FAMILY PRACTICE PHYSICIAN — Wanted to join a thirteen physician multi-specialty group in Robbinsdale, Minnesota. Next to North Memorial Medical Center. Fringe benefits are excellent and salary is very competitive. A second satellite office is located in Maple Grove. Clinic is a provider for three H.M.O's. Please contact Clinic Manager at North Clinic P.A. 3210 Lowry Ave. No., Minneapolis, MN 55422 1-(612)-588-4625.

WANTED: G.P. for family practice. West Central N. Dak. Twenty five bed Hospital on Interstate 94 only 75 miles from Medical center with Air Ambulance available. Two other physicians in area. Contact 701-974-3304 or write Box H, Richardton, N.Dak. 58652.

FULL-TIME GENERAL PSYCHIATRIST. Duties include: triage, outpt, day treatment, inpt, consultative and forensic psychiatric services in an experienced rural community mental health center (since 1959) affiliated with gen med and surg hosp having an outstanding 10-bed acute short-term psychiatric service. Work is 80% direct service and 20% consultation, supervision and education. Applicants must have completed approved residency and need Minnesota Med. Lic. Starting salary \$60,675 and up, depending on qualifications. Year-around local university-related CME program supplemented annually by 10 days paid educational leave with opportunities for active participation in state and national psychiatric groups. Equal opportunity employer provides professional liability insurance, 70% of premium for family health insurance coverage; excellent retirement program and generous vacation benefits. Economically sound, progressive family community in forest and lake country. Write or call Frank Kiesler, M.D., Medical Director, 215 Second Avenue SE, Grand Rapids, Minnesota 55744; 218-326-1274.

FAMILY PHYSICIAN, board eligible, to join group of six Board Certified Family Practitioners and one Board Certified General Surgeon in Blue Earth, Minnesota. \$45,000.00 plus incentive bonus first year with full membership after first year. 4,000 population with practice area of 25,000 in South Central Minnesota. Economy is stable agricultural plus small clean industries. Connected hospital and clinic enlargements now under construction. Complete ancillary support including anesthesiology, radiology, pathology, etc. Contact Marjeane Werner, Clinic Administrator or Dr. Thomas E. Watts, Business Phone: (507) 625-7371. Blue Earth Medical Center, Ltd., 520 South Galbraith, Blue Earth, MN 56013.

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20 ACRE WISCONSIN ST. CROIX River retreat with two cabins. Call 715-262-3526.

(Continued on page 272)

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(Continued from page 271)

ALL OF THE ADVANTAGES . . . An opportunity to practice primary care with a progressive group of physicians that values quality medicine, patient and family — centered practice, continuity of care, service to the community, and group compatibility in a location where the advantages of the Twin Cities are easily available but in a small town with the freedoms of a slower paced atmosphere.

This four-physician Family Practice is interviewing for two Family Practitioners to join the group to meet the patient needs in Glencoe and Lester Prairie, Minnesota. Glencoe is an ideal community — excellent schools, established industry and commerce, accredited hospital — and is only 53 miles from Minneapolis/St. Paul.

We welcome your interest and questions. Please contact Donald B. Rudy, M.D. or Gary Van House, Administrator, Glencoe Medical Clinic P.A. 525 East 18th Street, Glencoe, Minnesota 55336, (612) 864-3116.

INTERNIST-CARDIOLOGIST, INTERNIST-NEPHROLOGIST specialty positions available with Mankato Clinic, Ltd. Our 30 man multi-specialty group attracts specialty referrals from a southern Minnesota area of 200,000 population. Excellent group practice opportunity in All-American community with full hospital services; full range of group fringe benefits; liberal time off; salary first year; incentive pay thereafter. For more information call collect R. F. Roskens, Administrator, or Dr. B. C. McGregory, 507-625-1811.

TEXAS NEEDS DOCTORS. Immediate openings for family physicians, emer. room, gen. surgeon, internists, neurologist, ob/gyn, ophthalmologist, orthopods, ent, and pedis in Dallas and other cities/towns throughout the state. Group or solo opportunities with generous guarantees where they need additional physicians, and other physicians will give you referrals. Vacancies available because of retirement. No state income or corporate taxes in Texas. No fee. Contact Texas Doctors Group, Box 177, Austin, Texas 78767 (512/476-7129).

LOCUM TENEN SERVICES — If you need temporary coverage or wish work providing coverage in primary care, contact: INTERHEALTH, 5695 Merry Lane, Excelsior, MN 55331. 612/474-4372

OFFICE SPACE FOR RENT: Physician in Loring Park area of Minneapolis wishes to rent part of his office to another Doctor. Six exam rooms, x-ray, lab, procto table, etc. Adjacent to hospital. Call 612-870-8448.

STAFF PSYCHIATRIST CMHC has an excellent opportunity for a staff psychiatrist. Must be board eligible. Programs include in-patient, out-patient, education and consultation, specialized services to children, the chronically mentally ill, and the chemically dependent delivered in conjunction with a seasoned team of multi-disciplinary mental health professionals including two part-time psychiatrists. Excellent four-season recreational area. Salary and fringe benefits negotiable. Contact: Donald E. Frees, ACSW, Area Program Director, P.O. Box 646, Bemidji, MN 56601. An Equal Opportunity Employer.

FAMILY PHYSICIAN to join three Board Certified Family Physicians in a young and growing medical practice in Central Minnesota. The practice is orientated toward Family Practice Medicine and located centrally in the state with quick access to the Minneapolis-St. Paul area. Both practices are a short distance from the St. Cloud area, and our physicians use the St. Cloud Hospital for hospitalization of their patients. Cultural and recreational activities are abundant in this area of Minnesota. The salary and fringe benefits are open and negotiable. If interested, please contact Thomas J. Newton, M.D., Medical Director, or contact Daryl G. Mathews, Administrator, at either the St. Joseph or the Cold Spring Medical Clinics, 26 North Red River Avenue, Cold Spring, Minnesota, 56320, or call collect (612) 685-8641 or (612) 363-7765 in St. Joseph, Minnesota.

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WANTED: Ob-Gyn, family practitioner, and pediatrician to join multi-specialty group. One month vacation, hunting, fishing and lake recreation area. Starting salary excellent, many fringe benefits included. Write: MINNESOTA MEDICINE (731), 2221 University Ave. SE, Suite 400, Minneapolis 55414.

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OPPORTUNITY FOR qualified physicians at the Albert Lea Clinic, P. A., in Albert Lea, Minnesota. The clinic is a seventeen man multi-specialty group in primary and secondary care fields. The financial rewards are exceptional and practice challenges very attractive. There is a negotiated salary at top level for the first year. Senior physician participation begins at the end of the first year with a incentive income distribution plan plus expanded fringe benefits. The clinic has a low cost buy in with a maximum profit sharing plan. There is a top level insurance program, medical reimbursement program, and a full range of other benefits. A nearly new hospital in the city provides an exceptional place to work. These are choice practices in a delightful place to live. We are currently looking for physicians in general orthopedic medicine, in Otolaryngology, one OB-GYN. Please contact B. J. Boss, Administrator, Albert Lea Clinic, P. A., 1602 Fountain Street, Albert Lea, MN 56007. Phone 507-373-8251. Personal phone 507-377-1406 or contact L. E. Shelhamer, Jr., M.D., 507-373-8251 or personal phone 507-377-1530.

LA CROSSE, WI — NEONATOLOGIST needed to join 50-physician multispecialty clinic with four pediatricians/one neonatologist. Will be co-director of 14-bed, Level III, Regional Infant Intensive Care Unit in modern 350-bed hospital immediately adjacent to clinic. CT scanner and complete ultrasound available. Medical staff of 98 M.D.'s includes neurosurgeon with pediatric cardiologist, neurologist and surgeon on courtesy staff. Complete transport team with three neonatal nurse clinicians. La Crosse is a progressive, family-oriented city of 50,000 in the beautiful Mississippi River Valley with a medical referral area of greater than 200,000. Exceptional cultural, educational and recreational opportunities locally. Contact: P. S. Shultz, M.D., Medical Director, Skemp-Grandview-La Crosse Clinic, 815 S. 10th St., La Crosse, WI 54601. Phone 608/782)9760.

ORTHOPEDIC SURGEON: Cambridge, Minnesota: 45 minutes from downtown Twin Cities: Beautiful recreational area: Good schools: New Hospital: Excellent opportunity for board Certified Orthopedic Surgeon to join 17-man multispecialty group, including one existing Orthopedic Surgeon: 1st year salary + : 2nd year partnership available: Please contact Administrator Al Nelson at 612/689-1411, Minneapolis 612/434-6622, or home phone 612/396-2504.

UROLOGIST: Cambridge, Minnesota: 45 minutes from downtown Twin Cities: Beautiful recreational area: Good schools: New hospital: Excellent opportunity for Board Certified Urologist to join 17-man multispecialty group: 1st year salary+: 2nd year partnership available: Please contact Administrator Al Nelson at 612/689-1411, Minneapolis 612/434-6622, or home phone 612/396-2504.

ST. PAUL-RAMSEY MEDICAL CENTER, Department of Psychiatry, career opportunity for a psychiatrist available in July, 1983. The position calls for clinical, educational and research efforts in the specialty. Competitive salary structure with liberal fringe benefits included. Applicants should contact Dr. V.B. Tuason, Department of Psychiatry, St. Paul-Ramsey Medical Center, 640 Jackson, St. Paul, MN. 55101.

INTERNIST, board certified/board eligible, to join established practice in Northfield, Minnesota. An opportunity to live and practice in truly one of the most delightful and stimulating communities in Minnesota. A broad array of diagnostic and clinical services provided locally and through specialties from the Twin Cities. The practice is relatively new, very stable, and with considerable potential. Northfield is the home of St. Olaf and Carleton Colleges and located a short drive from the metropolitan/medical centers of the Twin Cities and Rochester/Mayo Clinic. Call and send a brief vitae to: Cliff Christiansen, Administrator, Northfield City Hospital, 800 West Second Street, Northfield, Minnesota 55057 (Phone: 507-645-6661).

FAMILY OR GENERAL PRACTITIONER — Two-doctor Clinic with total staff of 35 recruiting family or general practitioner who desires long term residence in beautiful northcentral Wisconsin. Board certification and previous experience preferred but not required. 120 bed hospital twelve miles with excellent coverage arrangements. Competitive salary and/or net income split possible. More than thirty lakes within ten miles offer fishing, boating. Excellent opportunity for physician who desires outdoor activities and stimulating interdisciplinary practice setting. Send resume to Mr. Glen Safford, Box 398, Lac du Flambeau, WI 54538 (715) 588-3371. EOE, M/F.

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OFFICE SPACE FOR RENT: Excellent opportunity for physician to share medical office space with family practitioner in Minneapolis. Contact Dean Holmquist (612) 932-5124.

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OFFICE SPACE FOR RENT: Heart of downtown Minneapolis. Physicians in Medical Arts Building, 825 Nicollet Mall wish to sublet their facilities to another physician on a part-time basis. Call (612) 332-5316.

FAMILY PRACTITIONER — Join an active practice in Northern Minnesota. Two young F.P.'s are looking for one or two associates to replace retiring partner. Attractive clinic and 44 bed hospital in a friendly town of 2000. Contact W. Ofstedal, M.D., 218-435-1212, Fosston, Minnesota 56542.

PROFESSIONAL RESUME SERVICES. 1125 South Cedar Crest Boulevard, Allentown, Pennsylvania 18103. We provide resume preparation for physicians. All specialties. Call or write for information. (215) 433-4112.

LOCUM TENENS WANTED: U of MN trained FP desires locums position July 15 — September 15. Metro location preferred. Kenneth Dirlam, 8300 Virginia Circle South, St. Louis Park, MN 55426 612-542-9571.

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References: 1. Kales A et al: *J Clin Pharmacol* 17:207-213, Apr 1977 and data on file, Hoffmann-La Roche Inc., Nutley, NJ. 2. Kales A: Data on file, Hoffmann-La Roche Inc., Nutley, NJ. 3. Zimmerman AM: *Curr Ther Res* 13:18-22, Jan 1971. 4. Kales A et al: *JAMA* 241:1692-1695, Apr 20, 1979. 5. Kales A, Scharf MB, Kales JD: *Science* 201:1039-1041, Sep 15, 1978. 6. Kales A et al: *Clin Pharmacol Ther* 19:576-583, May 1976. 7. Kales A, Kales JD: *Pharmacol Physicians* 4:1-6, Sep 1970. 8. Frost JD Jr, DeLucchi MR: *J Am Geriatr Soc* 27:541-546, Dec 1979. 9. Dement WC et al: *Behav Med* 5:25-31, Oct 1978. 10. Vogel GW: Data on file, Hoffmann-La Roche Inc., Nutley, NJ. 11. Karacan I, Williams RL, Smith JR: The

sleep laboratory in the investigation of sleep and sleep disturbances. Scientific exhibit at the 124th annual meeting of the American Psychiatric Association, Washington, DC, May 3-7, 1971. 12. Pollak CP, McGregor PA, Weitzman ED: The effects of flurazepam on daytime sleep after acute sleep-wake cycle reversal. Presented at the 15th annual meeting of the Association for Psychophysiological Study of Sleep, Edinburgh, Scotland, June 30-July 4, 1975. 13. Data on file, Hoffmann-La Roche Inc., Nutley, NJ.

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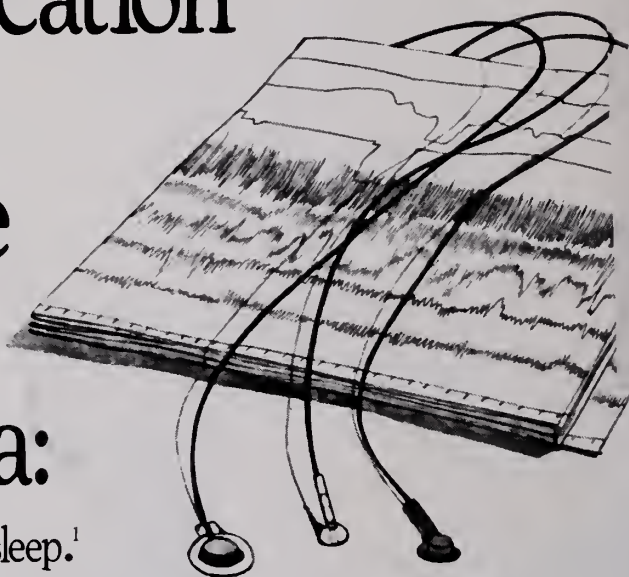
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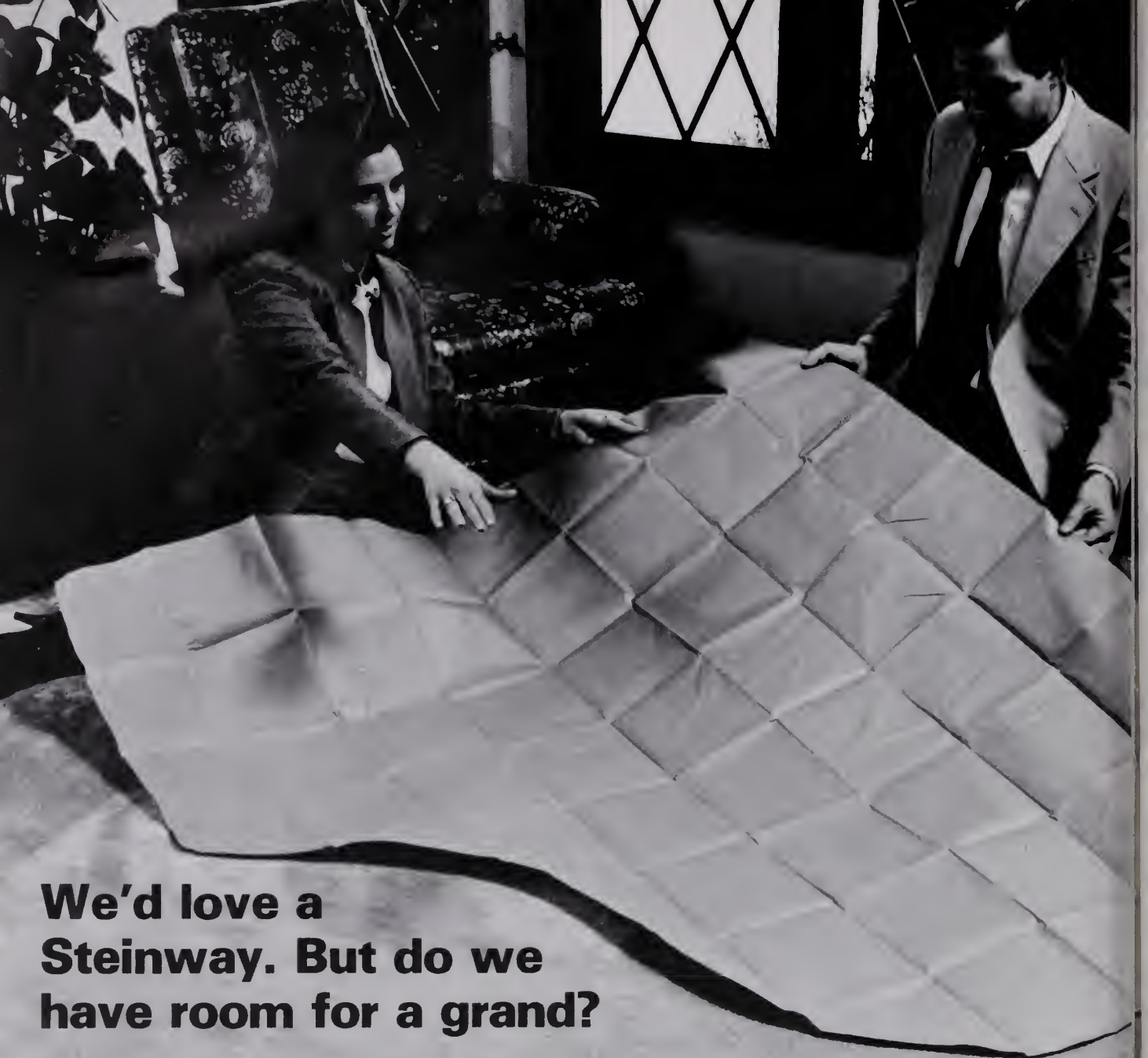
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May 1983





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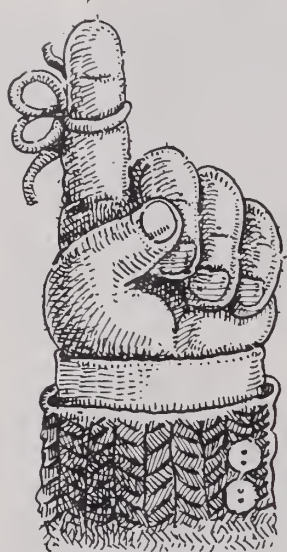
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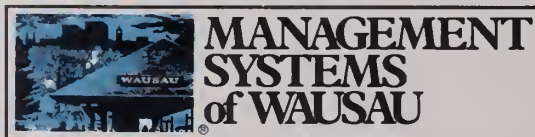
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President's Letter



It hardly seems possible that a year has passed, and this is my last letter in MINNESOTA MEDICINE to the MMA membership. It has truly been an honor and privilege to serve as your President.

A special note of thanks to Dr. Richard Reece and Dr. Elaine Nye for publishing this letter monthly in MINNESOTA MEDICINE. Dr. Reece has done an excellent job of combining scientific and socio-economic issues in your journal. Like my predecessors, I owe a special thanks to Elaine Nye for her advice and help with my letters.

The task of serving as your President has been pleasant and demanding. It has been pleasant, because I was a frequent ceremonial representative of the MMA, an organization which I was proud to represent. It has been demanding because of the many meetings one has to attend, be they Board of Trustees' meetings, committee meetings, or representing the MMA at other health-related organizations. It certainly was an educational year.

Under the new leadership of Mr. Doug Shaw, our staff has continued to excel in all areas. It is of the utmost necessity that we reorganize our committee structure to better utilize our staff. In the future we will see more issues handled by ad hoc committees which are self limiting in time. This should put less strain on our staff.

We are indebted to all those physicians who involve themselves as contacts in the legislative process. Our Committee on Legislation, headed by Dr. Chet Anderson, continues to do excellent work on all legislative matters pertaining to health. They together with staff do an excellent job in presenting and prioritizing legislative matters to the Board of Trustees. Those physicians who did serve as legislative contacts served a unique purpose.

Dr. Delwin Ohrt of Mankato became the new Chairman of the Board of Trustees following the annual meeting in May, 1982. Through countless hours of labor he keeps himself well-informed on all

issues local and national. It has been a distinct pleasure working with him this past year.

As one reads the articles of incorporation of the MMA, one finds that the purpose of our organization is concern over the health and welfare of the people of Minnesota and to deal with this wholeheartedly. Our organization was founded to promote the art and science of medicine and the betterment of public health. We have certainly succeeded in doing this over the past 130 years, and we must continue to find ways to show our patients and the public all the positive things that exist in our organization.

The future holds many changes for us. We will see new methods of practice and new technology. We will see decreasing regulation and increasing competition in the marketplace. We will see rationing of medical care and many issues of an ethical nature that will be disturbing. Your MMA will continue to represent the physicians of Minnesota in this changing world. For this reason, it needs the support of all of you. Scientific excellence is no longer enough; we must be involved in socio-economic issues affecting our patients and the public.

It was my good fortune to grow up in a small Minnesota town during the depression years. My father and uncle were general practitioners who, with my mother's help, ran a small hospital. All Xrays and laboratory studies were done by them. Farm home deliveries and house calls were routine. A horse and sleigh were kept in the barn for winter house calls. Payment was in barter: a half a pig, dozens of eggs, or home canned foods.

As a young boy, I would join my father on house calls many miles into the country. By the age of twelve, I was taking movies of his and my uncle's surgery procedure with a home camera. The influence of my parents and uncle left such an impression that my future vocation was decided early.

After over a half-century of exposure to the changing medical scene, a thought frequently crosses

PRESIDENT'S LETTER

my mind. In younger years, the physician and hospital were one. With increasing technology and specialization, they became separate forces. Now, with both fields under harsh socio-economic pressures, my hope is that they will unite for the benefit of all.

In closing, a special thanks to the other officers and members of the Board of Trustees whose efforts made the year less toilsome. My gratitude to our excellent staff for their devoted service. My successor, Dr. Don Bell of Minneapolis, comes well prepared to assume

the office. He can be assured of any assistance that I can provide. Again, it has been an honor and privilege to serve you. Many thanks for that privilege.



Severin H. Koop, M.D.
President
Minnesota Medical Association

MINNESOTA MEDICINE Covers

In order to select the best cover pictures for MINNESOTA MEDICINE the cover editor requests that all amateur photographers search slide collections and submit more pictures. The appreciation of beauty is always quite subjective, whereas the selector might find a different picture desirable for the cover. Such factors as the background, the amount of lighting, and the presence of extraneous background images on the slide may make a cover selection less desirable. It is suggested that several of your better pictures be submitted for consideration in the hopes that one might be chosen. Currently the cover editor is in need of photographs starting with next November's edition which would include late fall and winter scenes. It is requested that vertically positioned slides be submitted at this time in order to try a changed cover format.

Bruce Nydahl, M.D.
Cover Editor

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Candidate for Re-election to the AMA Board of Trustees



Robert T. Kelly, M.D.

Dr. Robert T. Kelly, Grand Rapids family physician, is a candidate for re-election to the AMA Board of Trustees at the 1983 Annual Meeting of the AMA House of Delegates which commences on June 19 in Chicago.

Elected in 1980 to the AMA Board, Dr. Kelly will be seeking his second term. He received more votes than any other candidate in 1980. He has been endorsed by the Minnesota Medical Association and the North Central Medical Conference. Dr. William E. Jacott, Duluth, is chairing the Committee to Re-elect Bob Kelly and Dr. Robert S. Flom, St. Paul, chairs Minnesota's AMA delegation.

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Editor's Notebook

Perils of the Plastic Heart

Second Thoughts and Second Opinions

Barney Clark died on March 23, 1983, 112 days after he received mankind's first plastic heart. In those four months of extra life, he suffered through these perils — a malfunctioning valve in his plastic heart, seizures, periods of mental confusion, ruptured emphysematous blebs, renal failure, respiratory insufficiency, nosebleeds, and, in the end, uncontrollable sepsis. His mind and spirit endured, and his plastic heart kept beating. In other words, his heart survived, but his body failed.

Second Thoughts

This human experiment with the plastic heart prompted an outpouring of second thoughts. The other pioneers of heart transplant work — Drs. De Baakey, Cooley, and Shumway — said the plastic heart was a bad idea because a heart transplant ought to return a patient to normal life. Shumway remarked: "Who would like to be attached to something the size of a refrigerator the rest of his life?" From the *New York Times*, in an editorial entitled "Barney Clark and Lord Tennyson," came this piece of poetic prose:¹

"Perhaps experiments should now continue in animals, not humans, until further progress has been made with implantable power packs. The Utah heart has been tested in calves, one of which, named Lord Tennyson, lived for 268 days after the operation. Could the reason for that name be Tennyson's poem about Tithonus, the youth given immortality by the goddess who fell in love with him? Extra life without extra youth, as Tithonus later reproached her, proved unwelcomed: 'But thy strong Hours indignant work'd their wills, / And beat me down and marr'd and wasted me! . . . Let me go; take back thy gift.'"

"Modern medicine rejects the ideas of immutable bounds to human life, and technology gives us increasing powers to push back the old limits. But on a list of medical priorities the artificial heart, despite its glamor, cannot rank high. Dr. Clark volunteered to be a guinea pig; we honor his courage and mourn his death."

Two Second Opinions

And from my January 1983 MINNESOTA MEDICINE editorial, "The Case for the Mechanical Heart Implantation: One Man's View of Its Human Significance," came two second opinions in the form of two Letters to the Editor. If you'll recall that editorial, I opined the operation was a good thing because it showed the powers of human daring and creativity.

The First — A Dean's Dilemma

In the first second opinion, Doctor Robert Howard, former Dean of the University of Minnesota Medical School and now Editor-in-Chief of *Postgraduate Medicine*, informs me that those who think they are creative but are not can be a pain in the fundament.

EDITOR'S NOTEBOOK

"Dear Dick:

"This is just a brief note to express my appreciation for your article concerning the artificial heart.

"I thought you did a good job with this, and I was especially appreciative of your commentary concerning the nature of creativity. Much of my own life has been spent working with creative people, and my own observations — which I had never codified in the way you have — are in accord with your own.

"There is a related phenomenon that perhaps deserves to be discussed in a different context at some other time. That is the person who believes himself to be creative and, in truth, is not. Such people may expect or even demand the same kind of recognition and tolerance generally accorded the truly creative. To use your own words, they may be troublemakers, misfits, or nonperformers, yet expect the accolades awarded those whose accomplishments are very real. I have had to deal with more than one or two such people in my lifetime, and they do pose a real problem.

"Thanks, again, for a good editorial effort. With best wishes, I am"

Robert B. Howard, MD
Editor-in-Chief
Postgraduate Medicine

The Second — A Cardiologist's Criticisms

In the second second opinion, Doctor Howard Burchell, Emeritus Professor of Medicine from the Cardiovascular Section of the University of Minnesota Medical School, provides a more critical commentary. Doctor Burchell is formerly Editor of *Circulation* and recently wrote an article in JAMA entitled: "Important Events in Cardiology, 1940-1982: A Retrospective View"² He is, in short, a man who has been there and who knows of what he speaks.

"Dear Doctor Reece:

"You stimulated me in my thinking of the man with the artificial heart whose course I have followed in the papers and journals. You expected your essay to be provocative, and I have jotted down some of my thoughts concerning it, and I hope you will be interested and perhaps amused.

"In the January, 1983, issue of MINNESOTA MEDICINE, our respected editor has published from his *Notebook*, an essay on "The Case of the Mechanical Heart Implantation; One Man's View of Its Human Significance". Undoubtedly, he has expected that his assessment of the monumental accomplishment, and such it was, to be challenged. Indeed, alternate views would seem to have been invited. Here are my criticisms of Dr. Reece's report; which lie respectively in the domains of scientific accuracy, ethics and the semantics of creativity. Dr. Reece chose to omit any analysis of the economical aspects, and I shall also, as its importance deserves a separate report.

"In the first instance, as Dr. Reece acknowledges in an addendum, the information concerning the case was gleaned primarily from newspaper accounts. I expect the details, given as facts in the Case Report paragraphs, are accurate, but still one has to remember they have to be classified as "hearsay" evidence.

"In the second most important category of ethical considerations, debates about many issues will be engendered. These, indubitably would have been anticipated by the Salt Lake City group. I expect that they would claim no question has been raised which had not been discussed "in extenso". Three items which will engage the attention of the knowledgeable physician and the ethicist, are: Just how was the recipient chosen?, the significance of details in the long consent form which was signed, the choice in timing of the first human case with long-term dependency on a

EDITOR'S NOTEBOOK

bulky external energizing device, and the societal arrangements for the patient's life-time care (and the preparation of an autobiography?). Both the idly curious and deeply philosophic will hope to learn what was the nature of the man who chose a life tethered to an external support, if his intellectual and "creative" functions had remained intact. It is a coincidence that the first long survival cardiac transplant was also a dentist and his account of his operation remains an instructive document¹.

"In past centuries, the volunteer for the experiment might have come from a prisoner about to be hung or one with a life sentence and incurable heart disease. In this century, intelligence, favorable predictions of collaborative behavior and the requirement of full disclosure of risks with consent procedures, are the essential items for ethical human experiments. After reading about the survival of calves (and observing animals with artificial hearts), the question simply was: when would the first human case be done? The propriety of this question lingers on after the epochal event of December 2nd. This does not imply irresponsible prematurity. Nearly twenty years ago, Dr. Kolff predicted the first human case would be done within three years, with the clarion title "Today the calf, tomorrow man"².

"One difficult ethical question surfaced in the newspaper with "correction" (and suppression possibly) in a later interview. The background relates to concepts of human experimentation which are acceptable to society, expounded in the principles in the Declaration of Helsinki. One of the guidelines was that the individual should have the freedom to withdraw from the experiment at any time. Dr. Jarvik was quoted³, "the consent form allows Clark to withdraw at any time . . ." "There is no way that we could deny the patient the right to commit suicide". The statement may be struck from the records; but it is enough to substantiate the insoluble problems which could be expected to arise.

"In the third category of criticisms, I differ from Dr. Reece, in that I would not define the procedure as a high-level creative act, separate from, and transcending, all the previous fundamental research accomplishments. It was a bold step and will be a milestone to mark technological progress. We can expect many clinical, basic physiological and psychologic data to be forthcoming, contributing to the useful body of medical knowledge. Science fiction has often pre-empted scientific accomplishment, and there is a novel by writers who were residents at Stanford University, about a man with a nuclear-powered, implanted artificial heart⁴.

"In concluding, a quotation from Percival's "Medical Ethics" (1803)⁵ is worth contemplating: "that boldness in medical practice is more frequently the antecedent than the consequence of experience, is a melancholy truth. To the consideration of physicians, who are thus prematurely confident in their own powers, the remark of Lord Verulam may be recommended. 'This is well to be weighed that boldness is ever blind for it seeth not dangers and inconveniences, therefore it is ill in counsel, good in execution . . . For in counsel it is good to see dangers and in execution not to see them, except they be very great' ". Additionally, from Osler: a quotation from John Bunyan, "Physicians . . . if they would have a name and a fame, if they will have it quickly they must do some great and desperate cures. Let them fetch one to life that was dead . . . and he, that can do thus, if he does thus first, he shall have the name and fame he serves; he may lie abed till noon". I shall also borrow from Osler's musings on creativity⁷. He stratified writers as being creators, transmuters and transmitters; emphasizing the paucity of the first group. The transmuters are those who rework existent scattered works into a book which lives into succeeding generations. This alchemy "in science the best transmuters have been the fruitful creators". In this sense, Kolff and Jarvik eminently qualify.

"I think the best technological framework in which to view the event, is by reviews of the artificial heart sections in the "Transactions of the American Society of Artificial Internal Organs" in which many of the original contributions of

EDITOR'S NOTEBOOK

William Kolff and his associates have appeared. Regardless of Dr. Barney Clark's outcome, the timeliness of the operation with present technological developments will remain an issue."

Howard B. Burchell, M.D.
Emeritus Professor of Medicine
Cardiovascular Section
University of Minnesota

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A Note of Thanks

Thank you, Doctors Robert Howard and Howard Burchell, for responding to my editorial and for nudging me closer to the heart of the matter.



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COVER PHOTOGRAPH

"Sunrise Over Copper Harbor, Michigan"

Dr. Thomas A. Ala, a resident at St. Paul Ramsey Medical Center specializing in Neurology, comes from Northern Michigan. He and his family spend a few weeks every summer up in Copper Harbor with his parents.

The cover photo was taken from Prockway Mountain Drive in 1980 looking into the harbor during vacation time.

Dr. Ala used a Nikon camera using Kodachrome 25 film, 200 mm lens, F32½ exposure.

The December, 1982, issue of MINNESOTA MEDICINE also had one of Dr. Ala's photographs on its cover.

Spontaneous Umbilical Cord Hematoma

A Rare Cause of Fetal Death

HARRY F. FARB, M.D.*, URSULA ROWLATT, D.M. (OXON)† and WILLIAM N. SPELLACY, M.D.†

Spontaneous hematoma of the umbilical cord is rare but can cause significant perinatal morbidity and mortality. A case is presented in which this event occurred at term and within two hours of recorded fetal heart tones. On the basis of the finding of a liver hematoma at autopsy, a fetal bleeding diathesis is suggested as the possible etiology for this event. Continuous electronic fetal monitoring may have detected fetal distress and allowed time for abdominal delivery of a live child and suggests that routine monitoring of even the low risk patient might reduce perinatal morbidity and mortality.

SPONTANEOUS UMBILICAL cord hematoma is a rare cause of perinatal morbidity and mortality and less than 60 cases have been recorded in the world's literature. The present case illustrates the sudden onset of this event and suggests a possible etiology.

Case Report

A 30-year-old gravida 5 para 4 last menstrual period was October 17, 1978. The patient had a history of bronchial asthma which was treated with Marax® until the first prenatal visit on April 16, 1979, when the Marax® was discontinued and Tedral® 25 mg. qid was begun. An ultrasound examination on July 19, 1979 confirmed a breech presentation and on July 28, 1979 the patient was admitted to labor and delivery having irregular contractions and normal fetal heart tones. Electronic fetal heart rate monitoring was not done. After two hours of observation, fetal heart tones could not be heard and an amniotomy was done which revealed a small amount of meconium stained amniotic fluid but no prolapsed cord. Internal monitoring did not record a fetal heart signal. After 12.5 hours of labor a stillborn female infant weighing 3900 gms. was delivered. The placenta weighed 650 gms. A large hematoma of the umbilical cord was noted which originated at the fetal skin and measured 13 cms. in length, 3 cms. in width at its origin, increasing to 3.9 cms. at its end portion (Figure 1). The hematoma lay around the umbilical vein while the arteries were at one side and clearly separate from the area of

bleeding (Figure 2). The umbilical vein lumen was not occluded by blood clot. Although no tear was demonstrated in the vein by study of numerous cross sections of the cord, the pathologist felt that the distribution of the hemorrhage suggested that a tear



Fig. 1 — Umbilical cord hematoma at the fetal end of the cord, which is the usual site.

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must have been present in that vessel. An additional finding at autopsy was another hematoma, unruptured and measuring 2x1.5 cms., lying beneath the capsule of the right lobe of the liver at its inferior margin.

Discussion

Hematomas spontaneously occurring in the umbilical cord are very rare with the incidence reported at 1/5505 to 1/6200 births.^{3,6} Usually spontaneous umbilical cord hematomas are caused by rupture of the umbilical vein, with only about 11% of the cases associated with hemorrhage from the umbilical artery.³ The hematoma most commonly occurs at the fetal end of the cord and is occasionally double or associated with a knot in the cord. The etiology is unknown but theories have included torsion, trauma, and syphilis, traction on a short cord, postmature pregnancies, congenital defects, and dissecting aneurysms.^{3,6} Schreier and Brown⁷ felt that their case represented a congenital defect of the umbilical vein with rupture through an area of necrosis. Although the hematoma may indicate a bleeding diathesis, usually no other bleeding sites have been noted. In the case reported here, a hematoma of the liver was also found which suggests that a fetal bleeding diathesis may have been involved in the etiology.

Umbilical cord hematomas may be innocuous¹, may be associated with fetal distress⁴ or may have an

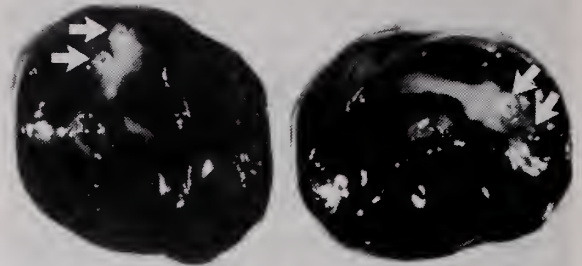


Fig. 2 — Umbilical cord hematoma which surrounds umbilical vein. The arrow denotes two umbilical arteries which are not apparently involved.

associated fetal mortality rate of 47%.^{2,3} Fetal hypoxia or death is secondary to compression of the umbilical vessels by the hematoma.

Umbilical cord hematoma is an unavoidable but real cause of unexpected intrauterine hypoxia and stillbirth in low risk pregnancies. Continuous electronic fetal heart rate monitoring in our case may have resulted in a different outcome had a diagnosis of fetal distress been made early and an expeditious abdominal delivery performed. Routine electronic fetal monitoring on all low risk patients may therefore reduce the morbidity and mortality of such rare spontaneous events and adds emphasis to the statement of Hobbins and colleagues⁵ that it is a mistake not to monitor the low risk patient.

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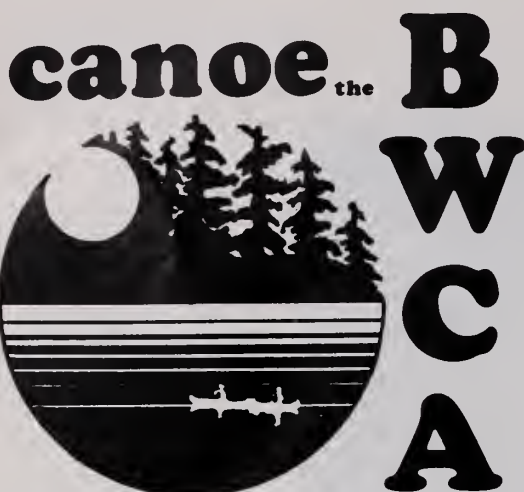


Cecil J. Watson, M.D.

Dr. Cecil J. Watson, 81, a world-renowned physician and expert on liver diseases died April 11, 1983, after a long illness. Dr. Watson was the lead researcher in the discovery of "hematin," the only known treatment of the metabolic disorder, porphyria.

A 1925 graduate of the University of Minnesota School of Medicine, Dr. Watson received a Ph.D. in hematology and pathology from the University of Minnesota in 1928, and served as the Chairman of the Department of Medicine there from 1943 to 1966.

He began his life-long study of liver functions in Germany in 1930, studying under the Nobel Prize winning chemist, Hans Fischer, where he accomplished the first crystallization of the biological substance, stercobilin. He continued his research in the United States with Dr. Samuel Schwartz, where they discovered a fundamental test for porphyria which now bears their names.



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BRIEF SUMMARY

PROCARDIA* (nifedipine) CAPSULES

For Oral Use

INDICATIONS AND USAGE: I. **Vasospastic Angina:** PROCARDIA (nifedipine) is indicated for the management of vasospastic angina confirmed by any of the following criteria: 1) classical pattern of angina at rest accompanied by ST segment elevation; 2) angina or coronary artery spasm provoked by ergonovine; or 3) angiographically demonstrated coronary artery spasm. In those patients who have had angiography, the presence of significant fixed obstructive disease is not incompatible with the diagnosis of vasospastic angina, provided that the above criteria are satisfied. PROCARDIA may also be used where the clinical presentation suggests a possible vasospastic component but where vasospasm has not been confirmed, e.g., where pain has a variable threshold on exertion or in unstable angina where electrocardiographic findings are compatible with intermittent vasospasm, or when angina is refractory to nitrates and/or adequate doses of beta blockers.

II. **Chronic Stable Angina (Classical Effort-Associated Angina):** PROCARDIA is indicated for the management of chronic stable angina (effort-associated angina) without evidence of vasospasm in patients who remain symptomatic despite adequate doses of beta blockers and/or organic nitrates or who cannot tolerate those agents.

In chronic stable angina (effort-associated angina) PROCARDIA has been effective in controlled trials of up to eight weeks duration in reducing angina frequency and increasing exercise tolerance, but confirmation of sustained effectiveness and evaluation of long-term safety in those patients are incomplete.

Controlled studies in small numbers of patients suggest concomitant use of PROCARDIA and beta blocking agents may be beneficial in patients with chronic stable angina, but available information is not sufficient to predict with confidence the effects of concurrent treatment, especially in patients with compromised left ventricular function or cardiac conduction abnormalities. When introducing such concomitant therapy, care must be taken to monitor blood pressure closely since severe hypotension can occur from the combined effects of the drugs. (See Warnings.)

CONTRAINDICATIONS: Known hypersensitivity reaction to PROCARDIA.

WARNINGS: Excessive Hypotension: Although in most patients, the hypotensive effect of PROCARDIA is modest and well tolerated, occasional patients have had excessive and poorly tolerated hypotension. These responses have usually occurred during initial titration or at the time of subsequent upward dosage adjustment, and may be more likely in patients on concomitant beta blockers.

Severe hypotension and/or increased fluid volume requirements have been reported in patients receiving PROCARDIA together with a beta blocking agent who underwent coronary artery bypass surgery using high dose fentanyl anesthesia. The interaction with high dose fentanyl appears to be due to the combination of PROCARDIA and a beta blocker, but the possibility that it may occur with PROCARDIA alone, with low doses of fentanyl, in other surgical procedures, or with other narcotic analgesics cannot be ruled out. In PROCARDIA treated patients where surgery using high dose fentanyl anesthesia is contemplated, the physician should be aware of these potential problems and, if the patient's condition permits, sufficient time (at least 36 hours) should be allowed for PROCARDIA to be washed out of the body prior to surgery.

Increased Angina: Occasional patients have developed well documented increased frequency, duration or severity of angina on starting PROCARDIA or at the time of dosage increases. The mechanism of this response is not established but could result from decreased coronary perfusion associated with decreased diastolic pressure with increased heart rate, or from increased demand resulting from increased heart rate alone.

Beta Blocker Withdrawal: Patients recently withdrawn from beta blockers may develop a withdrawal syndrome with increased angina, probably related to increased sensitivity to catecholamines. Initiation of PROCARDIA treatment will not prevent this occurrence and might be expected to exacerbate it by provoking reflex catecholamine release. There have been occasional reports of increased angina in a setting of beta blocker withdrawal and PROCARDIA initiation. It is important to taper beta blockers if possible, rather than stopping them abruptly before beginning PROCARDIA.

Congestive Heart Failure: Rarely, patients usually receiving a beta blocker have developed heart failure after beginning PROCARDIA. Patients with tight aortic stenosis may be at greater risk for such an event.

PRECAUTIONS: General: Hypotension: Because PROCARDIA decreases peripheral vascular resistance, careful monitoring of blood pressure during the initial administration and titration of PROCARDIA is suggested. Close observation is especially recommended for patients already taking medications that are known to lower blood pressure. (See Warnings.)

Peripheral edema: Mild to moderate peripheral edema, typically associated with arterial vasodilation and not due to left ventricular dysfunction, occurs in about one in ten patients treated with PROCARDIA. This edema occurs primarily in the lower extremities and usually responds to diuretic therapy. With patients whose angina is complicated by congestive heart failure, care should be taken to differentiate this peripheral edema from the effects of increasing left ventricular dysfunction.

Drug Interactions: Beta-adrenergic blocking agents. (See Indications and Warnings.) Experience in over 1400 patients in a non-comparative clinical trial has shown that concomitant administration of PROCARDIA and beta-blocking agents is usually well tolerated, but there have been occasional literature reports suggesting that the combination may increase the likelihood of congestive heart failure, severe hypotension or exacerbation of angina.

Long-acting nitrates. PROCARDIA may be safely co-administered with nitrates, but there have been no controlled studies to evaluate the antianginal effectiveness of this combination.

Digitalis. Administration of PROCARDIA with digoxin increased digoxin levels in nine of twelve normal volunteers. The average increase was 45%. Another investigator found no increase in digoxin levels in thirteen patients with coronary artery disease. In an uncontrolled study of over two hundred patients with congestive heart failure during which digoxin blood levels were not measured, digitalis toxicity was not observed. Since there have been isolated reports of patients with elevated digoxin levels, it is recommended that digoxin levels be monitored when initiating, adjusting, and discontinuing PROCARDIA to avoid possible over- or under-digitalization.

Carcinogenesis, mutagenesis, impairment of fertility. When given to rats prior to mating, nifedipine caused reduced fertility at a dose approximately 30 times the maximum recommended human dose.

Pregnancy. Category C. Please see full prescribing information with reference to teratogenicity in rats, embryotoxicity in rats, mice and rabbits, and abnormalities in monkeys.

ADVERSE REACTIONS: The most common adverse events include dizziness or light-headedness, peripheral edema, nausea, weakness, headache and flushing each occurring in about 10% of patients, transient hypotension in about 5%, palpitation in about 2% and syncope in about 0.5%. Syncopal episodes did not recur with reduction in the dose of PROCARDIA or concomitant antianginal medication. Additionally the following have been reported: muscle cramps, nervousness, dyspnea, nasal and chest congestion, diarrhea, constipation, inflammation, joint stiffness, shakiness, sleep disturbances, blurred vision, difficulties in balance, dermatitis, pruritus, urticaria, fever, sweating, chills, and sexual difficulties. Very rarely, introduction of PROCARDIA therapy was associated with an increase in anginal pain, possibly due to associated hypotension.

In addition, more serious adverse events were observed, not readily distinguishable from the natural history of the disease in these patients. It remains possible, however, that some or many of these events were drug related. Myocardial infarction occurred in about 4% of patients and congestive heart failure or pulmonary edema in about 2%. Ventricular arrhythmias or conduction disturbances each occurred in fewer than 0.5% of patients.

Laboratory Tests: Rare, mild to moderate, transient elevations of enzymes such as alkaline phosphatase, CPK, LOH, SGOT, and SGPT have been noted, and a single incident of significantly elevated transaminases and alkaline phosphatase was seen in a patient with a history of gall bladder disease after about eleven months of nifedipine therapy. The relationship to PROCARDIA therapy is uncertain. These laboratory abnormalities have rarely been associated with clinical symptoms. Cholestasis, possibly due to PROCARDIA therapy, has been reported twice in the extensive world literature.

HOW SUPPLIED: Each orange, soft gelatin PROCARDIA CAPSULE contains 10 mg of nifedipine. PROCARDIA CAPSULES are supplied in bottles of 100 (NOC 0069-2600-66), 300 (NOC 0069-2600-72), and unit dose (10x10) (NDC 0069-2600-41). The capsules should be protected from light and moisture and stored at controlled room temperature 59° to 77°F (15° to 25°C) in the manufacturer's original container.

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Recurrent Episodes of Spontaneously Resolving Hyperthyroidism Due to Thyroiditis

JOHN P. BANTLE, M.D.,* STEPHEN BEYER, M.D.,* and JACK H. OPPENHEIMER, M.D.*

Three patients each experienced multiple episodes of spontaneously resolving hyperthyroidism due to thyroiditis. Collectively, they experienced 11 episodes and one patient suffered five episodes during a period of 15 years. The episodes were characterized by the usual symptoms and signs of hyperthyroidism, elevated circulating levels of thyroxine, and depressed radioactive iodine uptake by the thyroid. Neck pain and tenderness were absent. Spontaneous recovery occurred within four months of the onset of each episode. After recovery from their most recent episodes, two patients were treated with ^{131}I to ablate the thyroid and prevent future recurrences.

SPONTANEOUSLY RESOLVING hyperthyroidism due to thyroiditis is a disorder which results from release of preformed hormone from a thyroid gland damaged by inflammation. During the hyperthyroid phase it can be distinguished from other more common forms of hyperthyroidism by depressed radioactive iodine uptake. When due to subacute thyroiditis (De-Quervain's thyroiditis) neck pain, neck tenderness, and fever are prominent symptoms and the sedimentation rate is usually elevated.^{1,2} In contrast, several recent reports have described patients with spontaneously resolving hyperthyroidism without neck pain, neck tenderness, or fever and normal or minimally elevated sedimentation rates.³⁻⁹ Thyroid biopsy in patients with this form of spontaneously resolving hyperthyroidism has revealed lymphocytic thyroiditis in all cases.^{4,5,7-9}

As the name implies, spontaneous recovery from this disorder is to be expected. Whereas some patients may experience a second episode of hyperthyroidism,^{8,9} it is not generally appreciated that multiple episodes can occur. The present report describes three patients who experienced two or more episodes of spontaneously resolving hyperthyroidism. Two patients were eventually treated with ^{131}I during an intercritical period in an attempt to ablate the thyroid and prevent recurrence.

Methods

Serum T_4 RIA, T_3 RIA, T_3 resin uptake ratio, and TSH were all measured in the routine chemistry laboratories of the University of Minnesota as previously described.¹⁰ Normal values are as follows: T_4 RIA, 5.0-10.5 μg dl; T_3 RIA, 75-175 ng/dl; T_3 resin uptake ratio, 0.85-1.15; and TSH, 0-6.0 μU ml. T_4 Index was computed by multiplying T_4 RIA \times T_3 resin uptake and is normally 5.0-10.5 μg /dl. Radioactive iodine uptake by the thyroid was determined 24 hours after administration of 10 μCi ^{131}I . The normal range is 10-35 percent.

Case Reports

Case 1

A 58-year-old woman with type IIa hyperlipidemia and ischemic heart disease was hospitalized elsewhere in 1976 for evaluation and treatment of supraventricular arrhythmias and congestive heart failure. An elevated serum T_4 concentration of 16.2 μg /dl was discovered; however, radioactive iodine uptake at 24 hours was only 2.0 percent. Subtotal thyroidectomy was recommended but the patient refused the procedure. She was treated with digoxin, furosemide, and propranolol with eventual improvement. Re-evaluation one month after discharge revealed a serum T_4 of 7.9 μg /dl.

She was admitted to a different hospital in 1979 because of chest pain and congestive heart failure. Multifocal PVCs were present and were treated with lidocaine and, later, quinidine. In spite of this, she experienced an episode of ventricular fibrillation which was successfully treated with electrocardioversion. She was, subsequently, transferred to the University of Minnesota. There was no history of neck pain or tenderness. Physical examination revealed a nontender thyroid gland that was diffusely enlarged to an estimated weight of 40 gm (normal weight, 20 gm or less). An ECG showed a previous antero-septal myocardial infarction. Serum T_4 was 17.2 μg /dl, T_3 resin uptake 1.19, and T_4 index 20.5 μg /dl.

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Serum T_4 was 138 ng/dl. Antimicrosomal and antithyroglobulin antibodies were positive at titers of 1:1600 and 1:10, respectively. Radioactive iodine uptake at 24 hours was only 2.6 percent. She was treated with propranolol, propylthiouracil, procainamide, and digoxin with adequate control of her PVCs. When seen in clinic one month after discharge, she was doing well. Propylthiouracil was discontinued.

Four months after discharge, serum T_4 was 10.8 μ g/dl, T_3 resin uptake 0.87, T_4 index 9.4 μ g/dl, T_4 147 ng/dl and TSH 3.6 μ U/ml. Radioactive iodine uptake was 45 percent at 24 hours. She was treated with 12 mCi of 131 I in an attempt to ablate her thyroid gland and prevent future episodes of hyperthyroidism. Three months after radioactive iodine treatment, serum T_4 index was 2.4 μ g/dl and TSH was 120 μ U/ml. She was started on l-thyroxine and carefully titrated to the minimum TSH suppressive dose. No further difficulty with PVCs, congestive heart failure, or hyperthyroidism has been encountered.

Case 2

A 62-year-old woman was hospitalized elsewhere in 1966, 1968, 1973, and 1977 for evaluation of fatigue, tremor and supraventricular tachycardias. In 1968, she was noted to have a serum PBI of 17 μ g/dl in association with a radioactive iodine uptake of 3.0 percent. During the episodes in 1973 and 1977, serum T_4 concentrations were 11.0 and 24.0 μ g/dl, respectively. However, in both instances, radioactive iodine uptake at 24 hours was less than 1.0 percent. Following all four episodes, there was spontaneous resolution of symptoms over a period of approximately two months. Between episodes serum T_4 concentrations were normal.

In 1981, she experienced a fifth episode of fatigue and rapid heart rate. Evaluation elsewhere revealed a serum T_4 concentration of 18.6 μ g/dl. Six weeks after the onset of symptoms, she was referred to the University of Minnesota. There was no history of neck pain or tenderness. Examination disclosed a normal sized, nontender thyroid gland. An ECG showed sinus rhythm with a rate of 80. The PR interval was 100 msec, suggesting a pre-excitation syndrome; however, no delta wave was present. Serum T_4 was 10.5 μ g/dl, T_3 resin uptake 1.18, T_4 index 12.4 μ g/dl, and T_3 121 ng/dl. Basal serum TSH concentration was less than 1.0 μ U/ml. Thirty minutes following injection of 500 μ g of TRH, TSH concentration was 1.0 μ U/ml. Radioactive iodine uptake was 1.0 percent at 24 hours. Antimicrosomal antibodies were positive at a titer of 1:100 whereas antithyroglobulin antibodies were negative. The patient was thought to be recovering from an episode of hyperthyroidism and was discharged from the hospital without institution of therapy.

When seen in clinic six weeks later, she was feeling well and offered no complaints. Serum T_4 was 6.7 μ g/dl, T_3 resin uptake 0.67, and T_4 index 4.4 μ g/dl. Serum T_3 was 87 ng/dl and TSH 14 μ U/ml. Radioactive iodine uptake was 28 percent at 24 hours. She was treated with 29.5 mCi of 131 I in an attempt to ablate her thyroid gland and prevent future episodes of hyperthyroidism. Three weeks later, T_4 index and TSH were 2.3 μ g/dl and 49 μ U/ml, respectively, and treatment with l-thyroxine was started.

Case 3

A 41-year-old man developed fatigue, diarrhea, and a 25 lb. weight loss in 1968. Evaluation elsewhere revealed a serum PBI of 8.7 μ g/dl. However, radioactive iodine uptake was only 2.0 percent at 24 hours. Over the ensuing three months, his symptoms resolved spontaneously. In 1972, he again developed fatigue, diarrhea and weight loss. Serum PBI was 13.1 μ g/dl but radioactive iodine uptake was only 1.0 percent at 24 hours. He was treated with

methimazole and again experienced resolution of his symptoms in several months. Methimazole was discontinued in 1973. In 1974, serum T_4 concentration was normal.

In 1977, he experienced a third episode of fatigue, diarrhea and weight loss and was referred to the University of Minnesota for evaluation. There was no history of neck pain or tenderness. Examination revealed a nontender thyroid gland that was diffusely enlarged to an estimated size of 45 gm. Serum T_4 was 17.6 μ g/dl, T_3 resin uptake 1.51, T_4 index 26.6 μ g/dl, T_3 269 ng/dl, and TSH <1.0 μ U/ml. Radioactive iodine uptake was 1.0 percent at 24 hours. Antimicrosomal and antithyroglobulin antibody titers were both negative. He was treated with reserpine and phenobarbital.

When seen in clinic eight weeks later, his symptoms had resolved. Serum T_4 was 8.8 μ g/dl, T_3 resin uptake 1.21, T_4 index 10.6 μ g/dl, T_3 129 ng/dl, and TSH 1.3 μ U/ml. All medications were discontinued. He remained well until 1981 when he experienced a fourth episode of hyperthyroidism which was evaluated and treated elsewhere.

The clinical characteristics of the three patients are summarized in the Table.

TABLE
Characteristics of Patients with Spontaneously Resolving Hyperthyroidism

	Patient 1	Patient 2	Patient 3
Age	58	62	41
Sex	F	F	M
Goiter	yes	no	yes
Antimicrosomal Antibodies	1:1600	1:100	negative
Antithyroglobulin Antibodies	1:10	negative	negative
Serum T_4 (μ g/dl)*	17.2/10.8	10.5/6.7	17.6/8.8
Serum T_3 Resin Uptake*	1.19/0.87	1.18/0.67	1.51/1.21
Serum T_4 Index (μ g/dl)*	20.5/9.4	12.4/4.4	26.6/10.6
Serum T_3 (ng/dl)*	138/147	121/87	268/129
Serum TSH (μ U/ml)*	- /3.6	1.0/14	<1.0/1.3
131 I Uptake (% at 24 hrs.)*	2.6/45	1.0/28	1.0/-
Episodes of S.R.H.†	2	5	4

*value during hyperthyroid phase value after recovery

†spontaneously resolving hyperthyroidism

Discussion

These three patients have collectively experienced 11 self-limited episodes of hyperthyroidism. During all episodes, 24-hour radioactive iodine uptake by the thyroid gland was depressed. Such depression could be explained by exposure to large amounts of iodide from radiographic contrast media or other sources. However, as best we could determine, none of our patients had received such exposure. Hyperthyroidism with low radioactive iodine uptake could also be due to surreptitious administration of thyroid hormone but we view this possibility as unlikely in our patients. Rather, we believe the episodes of hyperthyroidism were due to thyroiditis with release of preformed thyroid hormone from a damaged gland.

The absence of neck pain and tenderness make subacute thyroiditis unlikely and suggest the diagnosis of spontaneously resolving hyperthyroidism due to lymphocytic thyroiditis. Other authors have called this disorder silent thyroiditis,³ thyrotoxicosis with painless thyroiditis,^{5,7} and hyperthyroiditis.¹¹

Spontaneously resolving hyperthyroidism due to lymphocytic thyroiditis is characterized by a non-tender, normal sized or moderately enlarged thyroid gland, elevated serum levels of T_3 and T_4 , depressed radioactive iodine uptake, and spontaneous resolution of symptoms, usually within three months. In those patients who have undergone thyroid biopsy during the hyperthyroid phase or after recovery, the histologic appearance has been indistinguishable from chronic lymphocytic thyroiditis.^{4,5,7-9} As was the case in one of our three patients, antimicrosomal and antithyroglobulin antibodies may not be elevated.⁹ At the time of their evaluations, two of our patients did not have the expected elevations in serum T_3 concentration. In the first case, this may have been because she was recovering from an episode of congestive heart failure, a disorder which can impair peripheral conversion of T_4 to T_3 .¹² The patient in Case 2 also had a normal serum T_3 concentration but was evaluated during the terminal phase of her episode of hyperthyroidism. She did, however, have a suppressed TSH response following TRH administration confirming the diagnosis of hyperthyroidism. Patient 1 was temporarily treated with propylthiouracil and Patient 3 with methimazole during hyperthyroid episodes. Since the hyperthyroidism in this disorder is due to release of preformed hormone, these drugs whose principal

effect is to inhibit thyroid hormone biosynthesis were probably unnecessary.

Several authors have pointed out that occasional patients may experience a second episode of spontaneously resolving hyperthyroidism.^{8,9} Our first patient, who had underlying ischemic heart disease, suffered an episode of ventricular fibrillation during her second episode. Because of her cardiac condition, we thought it was important to prevent a third episode of hyperthyroidism. Accordingly, she was treated with ^{131}I four months after the hyperthyroid episode at a time when her radioactive iodine uptake was 45 percent. Patient 2 has experienced five self-limited episodes of hyperthyroidism during a period of 15 years. Six weeks following her fifth episode, when her radioactive iodine uptake was 28 percent, she was also treated with ^{131}I . As expected, both patients became hypothyroid shortly after therapy with radioactive iodine and were placed on L-thyroxine. Patient 3 has suffered from four episodes of spontaneously resolving hyperthyroidism during a period of 13 years but has not yet been treated with ^{131}I .

When patients with spontaneously resolving hyperthyroidism have experienced multiple episodes of hyperthyroidism as did our patients, we believe it is appropriate to offer them definitive therapy with radioactive iodine. This can easily be accomplished two to four months after an episode of hyperthyroidism when radioactive uptake has returned to normal. However, patients must realize that such therapy will make it necessary for them to take life-long L-thyroxine therapy.

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Physicians in the News

Alvin L. Schultz, MD, FACP, of Minneapolis, has been elected a Governor of the 54,000-member American College of Physicians. Dr. Schultz, a specialist of internal medicine, will hold his post as Governor of Minnesota for four years.

Leighton G. Siegel, M.F. has been elected chief of the medical staff for 1983 at St. Paul Children's Hospital.

Brief Prescribing Information

CONTRAINDICATIONS: Patients with severe hypertension, severe coronary artery disease, and in patients on MAO inhibitor therapy, narrow-angle glaucoma, urinary retention, peptic ulcer, during an asthmatic attack.

Hypersensitivity: Contraindicated in patients with hypersensitivity or idiosyncrasy to sympathomimetic amines or phenanthrene derivatives.

Nursing Mothers: Contraindicated because of the higher than usual risk for infants from sympathomimetic amines.

WARNINGS: Use judiciously and sparingly in patients with hypertension, diabetes mellitus, ischemic heart disease, increased intraocular pressure, hyperthyroidism, or prostatic hypertrophy. May produce CNS stimulation and convulsions or cardiovascular collapse with accompanying hypotension.

Use with caution in patients with increased intraocular pressure, cardiovascular disease, hypertension or in patients with a history of bronchial asthma. Do not exceed recommended dose.

Use in Elderly: The elderly (60 years and older) are more likely to have adverse reactions to sympathomimetics. Overdosage in this age group may cause hallucinations, convulsions, CNS depression and death.

PRECAUTIONS: General: Should be used with caution in patients with diabetes, hypertension, cardiovascular disease and hyperactivity to epinephrine. The antihistaminic may cause drowsiness and ambulatory patients who operate machinery or motor vehicles should be cautioned accordingly.

Information for Patients: Antihistamines may impair mental and physical abilities required for the performance of potentially hazardous tasks, such as driving a vehicle or operating machinery, and mental alertness in children.

Drug Interactions: MAO inhibitors and beta adrenergic blockers increase the effect of sympathomimetics. Sympathomimetics may reduce the antihypertensive effects of methyldopa, mecamylamine, reserpine and veratrum alkaloids. Concomitant use of antihistamines with alcohol, tricyclic antidepressants, barbiturates and other CNS depressants may have an additive effect.

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Evaluation of Recurrent Respiratory Tract Infections in Children

RICHARD C. GEHRZ, M.D.*

The child with recurrent respiratory tract infections is one of the most common and difficult diagnostic challenges confronting the primary care physician. Identification of patients for further investigation and selection of appropriate laboratory tests is complicated by the frequent occurrence of respiratory illness in normal children and the large differential diagnosis of pathologic states predisposing to recurrent respiratory infection. In the following discussion, a systematic approach to clinical assessment, differential diagnosis, and laboratory investigation of these patients is presented.

RECURRENT RESPIRATORY tract infections in young children are a common concern of parents and present a difficult diagnostic and therapeutic challenge to the practicing physician. Since the normal child may develop several significant respiratory infections each year, the physician must look for clinical features that indicate unusual susceptibility to infection. Evaluation of these patients should include consideration of diffuse or localized pathological processes involving the respiratory system primarily and systemic diseases which typically manifest respiratory complications as part of their symptom complex. In the following discussion, a brief overview of the mechanisms of host defense in the lung will be presented. This will be followed by a review of the differential diagnosis of recurrent respiratory tract infections with emphasis on the patient with suspected immune deficiency disease.

Mechanisms of Host Defense

The respiratory tract is in direct contact with the external microbiologic environment and depends upon three major host defense mechanisms to prevent infection. The mucociliary mechanism mechanically removes infectious material from the respiratory tract and is the most important of the pulmonary defenses. Local or diffuse pulmonary diseases which damage the pseudocolumnar epithelium therefore make the lung highly susceptible to recurrent infection. A second critical component of defense in the respiratory tract is

that of the pulmonary alveolar macrophage, a phagocytic cell located in the alveolar lining. The alveolar macrophage is uniquely adapted to functioning in an aerobic environment and therefore may be compromised in hypoxic states or in areas of the lung where ventilation or perfusion are abnormal. The adaptive immune system, including both humoral and cell-mediated immunity, also plays a significant role in defense against infection.

Clinical Assessment of the Patient

Evaluation of the patient with recurrent respiratory infection begins with a thorough history and physical examination, looking for evidence of primary or secondary respiratory disease. The age at which symptoms first present may help to distinguish congenital from acquired disorders and may also identify diseases showing a specific age predilection. The mode of onset and course of the illness may also be helpful in understanding the underlying pathophysiologic process. A detailed investigation of the patient's past medical history should be obtained, including clinical and laboratory documentation of past infectious processes. Assessment of past medical history should include evaluation of the immunization status, allergic history, and environmental exposure to infectious or toxic agents. The family history should also be carefully documented, including incidence of contagious infectious diseases or familial illnesses affecting the respiratory tract. A thorough review of systems will also be helpful in determining the extent of the disease process.

Physical examination should include a thorough evaluation of all organ systems. Assessment of the

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lungs may help to determine whether the process involves a specific segment of the respiratory tract or is diffuse in nature. The general laboratory evaluation should include a complete white blood cell count and differential, an erythrocyte sedimentation rate, and a chest radiograph. Further laboratory investigation should be selected on the basis of the historical and physical findings.

Differential Diagnosis (Table 1)

The differential diagnosis of recurrent respiratory tract infections includes diffuse and local pathological processes involving the lungs primarily, systemic diseases with significant pulmonary involvement, and recurrent upper respiratory tract infections with no evidence of systemic disease.¹⁻³ Infectious agents known to be associated with chronic pulmonary disease include the granulomatous bacteriae, fungi, cytomegalovirus, and pneumocystis carinii. Although primary tuberculosis is uncommon in American children, it has been frequently identified in children immigrating to the United States from southeast Asia. Furthermore, this increasing reservoir may make primary tuberculous infection more common in the future. Cytomegalovirus and pneumocystis carinii have been reported in infants with chronic respiratory distress syndrome and may also be a significant cause of persistent pneumonia in apparently normal infants. Fungal agents such as histoplasmosis and coccidioidomycosis are endemic in certain parts of the United States and may be causative of diffuse pulmonary disease. Appropriate cultures, serologic studies, and a Mantoux skin test should be performed on all patients with suspected chronic pulmonary infection. In selected circumstances, lung biopsy for histology and culture may be required to establish the diagnosis.

Patients who have required prolonged mechanical ventilation or oxygen administration may develop bronchopulmonary dysplasia, predisposing to recurrent respiratory infections for a variable period.^{4,5} Necrotizing inflammatory processes involving the small airway of infants, such as those associated with Bordetella pertussis and adenovirus, may be associated with prolonged or recurrent respiratory symptoms.⁶ Pulmonary fibrosis may be idiopathic or may occur in patients receiving radiation to the chest or chemotherapeutic agents known to have pulmonary toxicity (i.e. methotrexate).⁷ In older children recurrent pulmonary infection may be the initial manifestation of asthma and therefore individual or family history of atopic diseases may be helpful in establishing this diagnosis. In selected cases, more specific

investigation for evidence of atopy including a peripheral eosinophil count, nasal smear for eosinophils, and immediate hypersensitivity skin testing should be performed.

Patients with documented recurrent or persistent pathological processes involving a local segment of the respiratory tract may require further diagnostic studies.⁸ A barium esophagogram may be helpful in excluding aspiration syndromes associated with tracheoesophageal fistula or neurologic dysfunction. Confirmation of bronchiectasis, congenital or acquired anatomical abnormalities, or foreign bodies may require bronchoscopy and/or bronchography. Nuclear imaging of the lung may be helpful in selected cases although the magnitude of radiation exposure may contraindicate this procedure in most cases.

The most common systemic disease associated with diffuse pulmonary complications in children is cystic fibrosis, with an incidence in excess of one in eighteen

TABLE 1

Differential Diagnosis of Recurrent Respiratory Tract Infections

Diffuse Pulmonary Diseases

Chronic Infections (tuberculosis, histoplasmosis, cytomegalovirus, pneumocystis carinii)
Bronchopulmonary Dysplasia (secondary to oxygen toxicity, mechanical ventilation, post-infectious)
Pulmonary Fibrosis (idiopathic or secondary to infection, infiltrative disease, irradiation, or chemotherapy)
Asthma
Emphysema

Systemic Diseases With Diffuse Pulmonary Complications

Cystic Fibrosis
 α -1 Antitrypsin Deficiency
Congenital Heart Disease
Immunodeficiency Disease

Local Pulmonary Diseases

Bronchiectasis (secondary to congenital anatomical abnormalities, post-pneumonia, or underlying chronic disease)
Anatomical anomalies (sequestered lobe, lobar emphysema, hypoplastic lung, chronic atelectasis)
Aspiration (tracheoesophageal fistula, neurologic dysfunction)
Foreign body

Upper Respiratory Tract Diseases

Recurrent/Chronic Rhinitis
Recurrent/Chronic Otitis Media
Recurrent/Chronic Sinusitis
Recurrent Pharyngitis/Tonsillitis

hundred children.⁹ This disease has protean manifestations which typically include failure to thrive, chronic malabsorption, and recurrent pulmonary infection. A sweat chloride determination can rapidly exclude this autosomal recessive disorder. Alpha-1-antitrypsin deficiency, while frequently associated with emphysema in adults, most typically presents as progressive hepatic disease in children without significant pulmonary involvement. When evidence of diffuse pulmonary disease is present in a young infant, consideration of congenital heart disease is important. Not uncommonly, these patients will present with recurrent pneumonia or upper respiratory tract infections as their primary complaint. It should be noted that isolated recurrent upper respiratory tract infections are generally not indicative of an underlying systemic disorder and therefore do not require extensive laboratory investigation.

Evaluation of the Human Immunologic System

A significant number of patients will require further evaluation of immunologic function when no primary systemic or pulmonary disease can be identified. There are seven major criteria which can be used to assess the likelihood of immunodeficiency (Table 2). The presence of any one of these criteria is sufficient to justify an initial screening immunologic workup.¹⁰⁻¹²

TABLE 2

Clinical Evidence of Immunodeficiency Disease

1. Recurrent infections involving single or multiple organisms.
2. Persistent infection with a single organism (refractory to appropriate treatment).
3. Single infection with an unusual (opportunistic) organism.
4. Unusually severe expression of infection with a common pathogen.
5. Non-specific symptoms frequently associated with immunodeficiency diseases (failure to thrive, chronic diarrhea, extensive dermatitis).
6. Clinical features associated with specific immunodeficiency syndromes.
7. Family history of recurrent infections or specific immunodeficiency disease.

The human immunologic system arises early in fetal life and differentiates into systems of nonspecific inflammation and adaptive immunity under the influence of developing lymphoepithelial organs (Figure 1).¹³⁻¹⁵ All elements necessary to the expression of immunity are present at the time of birth and are capable of mounting an effective defense against most infectious agents.

It is now apparent that the adaptive immune response is a complex process involving the presenta-

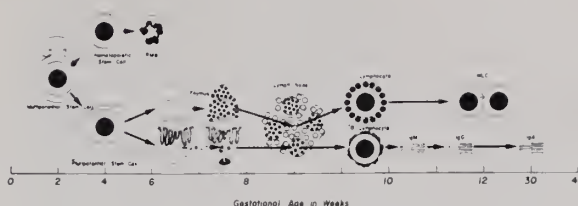


Fig. 1 — Development of the human immunologic system.

tion of antigen by a nonspecific phagocytic system involving circulating and fixed tissue macrophages to T lymphocytes bearing the appropriate receptor for the antigen in question. The T lymphocytes subsequently participate in the induction of B lymphocytes capable of producing antibodies specific for that antigen. In addition, the function of both T and B lymphocytes is subject to immunoregulation by suppressor and helper subpopulations of T lymphocytes. Therefore, classification of immunodeficiency states based on isolated defects of T and/or B lymphocytes, while useful, must also take into account the close functional interrelationship of the humoral and cell-mediated immune systems.

The humoral immune system involves the production of specific antibodies by effector cells called B lymphocytes. There are three major immunoglobulin classes involved in defense against infection. IgG antibodies are primarily involved in the host's defense against pyogenic organisms such as streptococcus, staphylococcus, Haemophilus influenzae and pneumococcus. Although IgG antibodies are also synthesized against the majority of viruses and fungi and may be useful in diagnosis, they play an uncertain role in defense against infection. IgM antibodies, or the macroglobulin antibodies, comprise the specific humoral immune response to gram negative enteric organisms and pertussis. The third antibody system, IgA, is uniquely involved in the protection of the respiratory tract, gastrointestinal tract, and urinary tract.^{16,17} B lymphocytes produce IgA antibody in the lamina propria. Two IgA molecules are subsequently attached to a secretory molecule produced in the epithelial cells of the mucosa prior to release into the secretions. This unique secretory dimeric IgA antibody is resistant to destruction in the external environment and provides local protection against invasion by viruses and bacteria.

Adequate screening evaluation of the humoral immune system requires the quantitative determination of levels of the major immunoglobulin classes in the serum. Immunoelectrophoresis, while qualitatively

demonstrating the presence or absence of the major classes of immunoglobulins, may not detect a significant percentage of the hypogammaglobulinemia syndromes. Therefore, quantitative determination by radial immunodiffusion should always be performed. This test can be obtained by sending serum to any reference laboratory and is relatively inexpensive. It is important to recognize that all infants have a relative deficiency in immunoglobulin that is associated with susceptibility to specific organisms (Figure 2).¹⁸ IgM does not cross the placenta and is present only in small amounts in the newborn unless intrauterine infection has stimulated synthesis. Therefore, newborns are prone to infection with gram negative enteric organisms requiring IgM for opsonization. As the maternal IgG which passively protects the infant disappears, the infant becomes susceptible to pyogenic organisms such as staphylococcus, streptococcus, Haemophilus influenzae, pneumococcus, and meningococcus until active immunity to these agents develops. IgA does not cross the placenta, explaining in part the high frequency of respiratory and gastrointestinal infections in the first year of life.

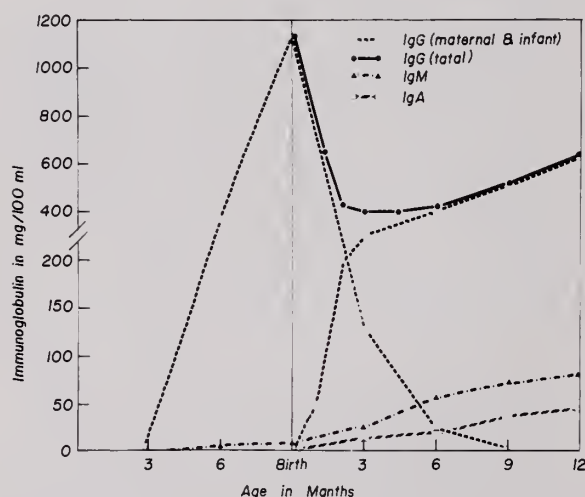


Fig. 2 — Quantitative immunoglobulins in the fetus and infant (from data of Stiehm and Fudenberg)¹⁸. By permission.

The T lymphocyte, or thymus derived lymphocyte, is the effector cell for cell mediated immunity and plays an essential role in host defense against most intracellular bacteria, viruses, fungi, and parasites. Cellular immunity is also involved in the rejection of transplanted organs and immune surveillance.

The most reliable test for evaluation of cell mediated immunity is that of skin tests for delayed hypersensitivity.^{19,21} These can be performed in any office by intradermal injection of a series of common

antigens including Candida, SK/SD (streptokinase-streptodornase), mumps, and tetanus. Children over the age of two years will demonstrate at least one positive skin test in 95% of cases. In cases where no delayed hypersensitivity reaction can be demonstrated, in vitro tests of cell mediated immunity may be indicated. These generally require referral to a diagnostic center which has the capability to perform these tissue culture assays.

The primary inflammatory response is a complex process involving opsonization, chemotaxis, phagocytosis, and intracellular killing of organisms (Figure 3).^{22,23} Opsonins are circulating serum factors which attach to bacteria or viruses and facilitate their adherence to and ingestion by neutrophils or monocytes. The opsonin system includes specific antibodies, the complement system, and a variety of nonspecific serum factors. Chemotaxis refers to the process of chemical attraction of neutrophils and/or monocytes to a site of infection and involves both the activated complement system and specific chemical factors released by bacteria. Once neutrophils migrate to a site of infection, a complex process of membrane and intracellular biochemical function is necessary to the eventual phagocytosis and killing of the organisms.

Screening diagnostic studies of the inflammatory response should include a white blood cell count with differential and examination of peripheral smear for morphology of neutrophils. Serum may also be sent to a reference laboratory for complement determination. The nitroblue tetrazoleum (NBT) dye test is available in many clinical laboratories and can be used to exclude certain neutrophil metabolic defects. Additional diagnostic studies require sophisticated research laboratory techniques and are not generally available.

Assessment of clinical susceptibility to infection is still the most sensitive indicator of immunodeficiency disease and can contribute greatly to identification of the specific immunologic defect. Patients with isolated humoral immune deficiency diseases present primarily with recurrent pyogenic infections, including pneumonia, meningitis, osteomyelitis, and septic arthritis. Those with primary cell mediated immune

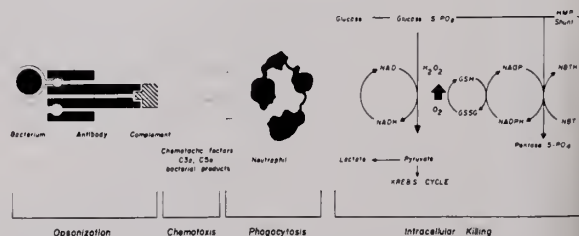


Fig. 3 — The primary inflammatory response.

deficiencies present with opportunistic infections or severe systemic complications of ordinarily benign infections. Patients with defects in inflammation generally develop recurrent abscess formation, particularly with staphylococci or other pyogens.

The great majority of primary immune deficiency diseases demonstrate some abnormality in quantitative immunoglobulin levels.²⁴ The most common is selective IgA deficiency (serum IgA < 5 mg/100 ml), occurring in approximately 1 out of every 800 individuals. Over 50% of these patients are recognized coincidentally and manifest no increased susceptibility to infection. A significant proportion, however, have mild recurrent respiratory infections and/or chronic diarrhea. Patients with agammaglobulinemia generally present with more severe systemic infections. Most patients with significant cell mediated immune deficiency diseases also have functional defects in immunoglobulin synthesis since humoral and cell mediated immunity are closely integrated in their function. While neutropenia is a common immune deficiency disease, congenital defects in neutrophil function, opsonization, or chemotaxis are relatively rare and, therefore, constitute only a small portion of

immune deficiency diseases.

Summary

Evaluation of patients with recurrent or chronic respiratory infections should include a thorough history and physical examination, chest radiography, and selected laboratory tests to exclude local or diffuse pulmonary diseases. When no primary pulmonary disease can be identified, a screening immunologic workup should be initiated. This should include quantitative immunoglobulins performed by radial immunodiffusion, a white blood cell count with differential, and examination of a peripheral smear for neutrophil morphology and presence of small lymphocytes. Skin testing with common antigens for evidence of delayed hypersensitivity should be performed in patients with possible cellular immune deficiency. If these tests are normal, there is only a small possibility that immune deficiency disease still exists. If continued clinical problems manifest themselves, these patients should then be referred to a diagnostic center capable of performing further in vitro morphologic and functional studies of the immune system.

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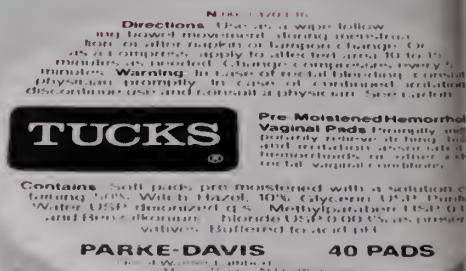
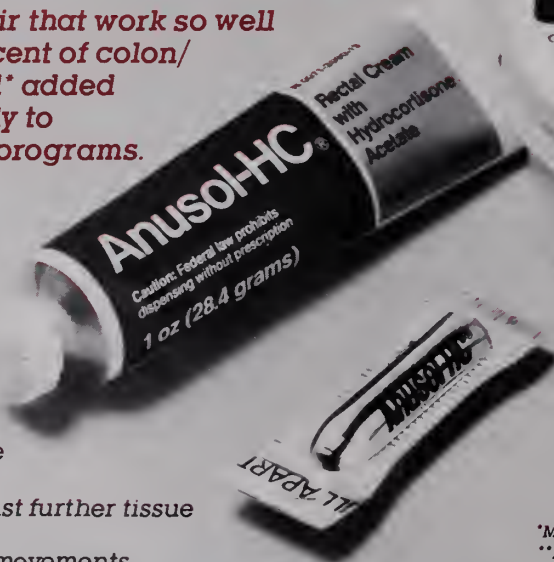
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DAVID E. TUBMAN, M.D.;* ROBERT E. MAXWELL, M.D., Ph.D.† and LAWRENCE H.A. GOLD, M.D.*

The treatment of carotid-cavernous fistulas has evolved from neurosurgical procedures which often sacrifice the carotid artery to percutaneous placement of detachable balloons allowing arterial preservation. The clinical presentation, radiologic evaluation and treatment of these cases will be discussed.

THE TREATMENT OF arteriovenous fistulas between the internal carotid artery and cavernous sinus is changing as improved radiologic techniques become available. The early management of these lesions resulted in obliteration of the fistula with sacrifice of the associated internal carotid artery. In recent years, operative techniques were developed which closed the fistula with preservation of the carotid artery lumen. We wish to describe the current treatment for these lesions as well as our experience.

Arteriovenous fistulas between the internal carotid artery and cavernous sinus or carotid-cavernous fistulas are either spontaneous or posttraumatic. Spontaneous cases may be due to rupture of an intracavernous carotid aneurysm, atherosclerotic degeneration of the artery wall or rupture through congenital defects in the media of the artery.¹ Traumatic cases are a result of basal skull fracture or penetrating injury through the orbit.

The intracavernous segment of the carotid artery lies between two leaves of dura surrounded by a venous plexus — the cavernous sinus. This sinus is one of the major intracranial venous plexus with connections anteriorly to the ophthalmic veins, posteriorly to the petrosal veins, superiorly to the sphenoparietal sinus and inferiorly to the pterygoid plexus.² The cavernous sinus is responsible for much of the superficial venous drainage of the temporal lobe and inferior frontal lobes. The oculomotor (III), trochlear (IV) and abducens (VI) cranial nerves as well as the ophthalmic and maxillary branches of the trigeminal (V) nerves traverse the sinus, lateral to the carotid artery.

The signs and symptoms of carotid cavernous fistulas are a result of the imposition of arterial

pressure upon the venous system and associated "steal" phenomena from the intracranial arterial circulation. Periorbital bruit, pulsating exophthalmos and chemosis are due to fistulization between the carotid artery and the superior ophthalmic vein via the cavernous sinus. Subsequent venous engorgement papilledema, retinal hemorrhage and detachment, glaucoma, corneal ulceration and neovascularization of the cornea producing opacities cause visual loss. Palsies of the III, IV and VI cranial nerves are frequent and are due to compression either by the distended walls of the cavernous sinus, the pressure of an associated intracavernous carotid aneurysm or direct trauma at the time of skull fracture or orbital penetration. Less commonly the V nerve is involved.³

Headache or orbital pain is a frequent complaint and may be due to the distention of the dura of the cavernous sinus.

Ischemia in the intracranial distribution of the involved carotid artery is infrequent. The siphoning effect of the fistula, particularly if associated with an incomplete circle of Willis or arteriosclerotic narrowing of the carotid arteries and resultant ineffective collateral flow may cause ipsilateral cerebral hemisphere ischemia.

The untreated carotid-cavernous fistula has three potential results. Spontaneous closure or fatal hemorrhage occurs in a small number of patients. Most commonly, slowly progressive increase in symptoms and in signs occurs so that in the majority of patients, therapy is indicated.^{3,4,7}

Early surgical procedures on these lesions consisted either of occlusion of the internal carotid artery in the neck or a combination cervical-carotid, intracranial-carotid and ophthalmic artery trapping procedure where the fistula was isolated. Early embolization procedures consisted of injection of

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muscle fragments into the carotid following intracranial carotid clipping.⁵ The first attempts at fistula occlusion with preservation of the carotid artery were carried out by Parkinson in a procedure which necessitated deep hypothermia, cardio-pulmonary bypass, and an intricate operative procedure.⁶ Hosobuchi and Mullan have described means of inducing cavernous sinus thrombosis using electrothrombosis, thrombogenic needles or bronze wire.^{7,8}

Percutaneous transvascular procedures have been widely utilized in the body for multiple applications. At present, intraarterial or intravenous balloon catheter approaches seem to have the most promise for fistula occlusion with preservation of the carotid artery.

Serbinenko,⁹ Debrun^{10,11} and Hieshima¹² have described the intra-arterial placement of a detachable balloon catheter into the cavernous sinus with release of the inflated balloon, occlusion of the fistula and carotid preservation. Latex or silicone balloons mounted on small (2 F) catheters are utilized. Kerber and Bank have described successful carotid cavernous fistula occlusions with non-detachable calibrated-leak balloons and a powerful intravascular adhesive, isobutyl-2-cyanoacrylate.¹³

Transvenous detachable balloon placement has been utilized with limited success due to the difficulty in placing the balloon at the exact site of the fistula.¹¹

Materials and Methods

Three carotid cavernous fistulas have been treated in our institution in the last two years with the Debrun-type detachable balloon catheters.

The detachable latex balloons range in size from .8 to 1.5 mm in the undistended state and expand to 4.5 to 10 mm. Clips may be positioned in the tips of the balloons for fluoroscopic localization. The balloons are tied with latex thread to the shaft of a 2 F Teflon catheter. This catheter becomes the inner catheter of a 2 F/3 F coaxial assembly which is the balloon placement and detachment system (Figure 1). The catheters are introduced via a femoral introducer sheath and 9 F Teflon catheters. Side ports are available for saline-heparin infusion and control contrast injection. Following satisfactory placement of the balloon on the venous side of the carotid cavernous fistula, the balloon is inflated with iso-osmotic Metrizamide (170 mg/ml/ml) until the fistula is occluded or the balloon is maximally distended. The balloon is detached by advancement of the outer 3 F coaxial catheter to the neck of the balloon and traction on the inner catheter or simply

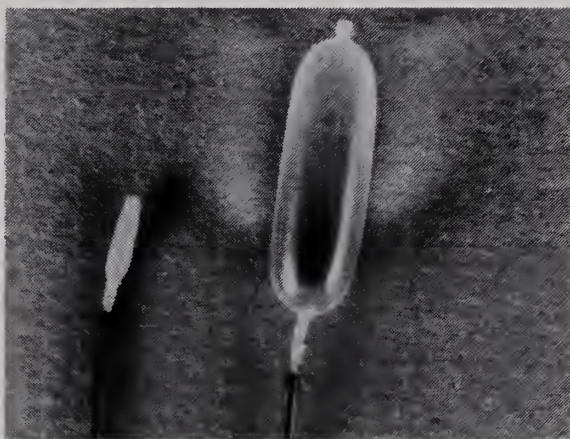


Fig. 1 — Latex balloons. (Left) — noninflated balloon (5 × 1.1 mm) tied to two F catheter, is situated inside three F catheter. (Right) — inflated balloon (18 × 8 mm). Note silver clip at tip of balloon.

with a steady pull on the inner catheter until the lack of resistance indicates balloon detachment.

Case Reports

Case 1

A 24-year-old male suffered a bathtub fall in March, 1979 and presented shortly afterward with diplopia, bruit, proptosis and chemosis. An unsuccessful balloon occlusion was attempted elsewhere. One year later, symptoms had progressed and he was transferred for treatment. Internal carotid angiography at this time demonstrated a left carotid cavernous fistula with the fistula site at the posterior ascending portion of the intracavernous carotid artery (Figure 2 (A)). Venous run-off occurred through both superior ophthalmic veins, the basilar plexus and basal vein of Rosenthal. Due to tortuosity of the approximal internal carotid artery, a cut-down was performed and a Number 9 balloon was placed in the fistula with inflation by .8 ml of Metrizamide. The fistula was occluded without stenosis of the internal carotid artery (Figure 2 (B)). One month follow-up exam revealed slight left proptosis and wide palpable fissure without bruit, conjunctival injection or dysfunction of the extraocular muscles.

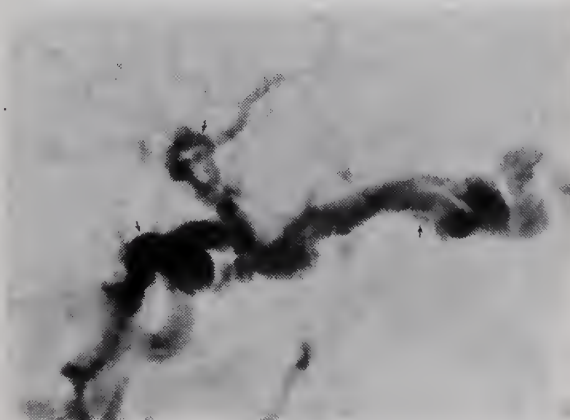


Fig. 2 — Preocclusion left internal lateral carotid angiogram. Anterior is to reader's right. (A) Left carotid-cavernous fistula is present with venous outflow into the superior orbital, inferior petrosal and deep middle cerebral veins (arrows).

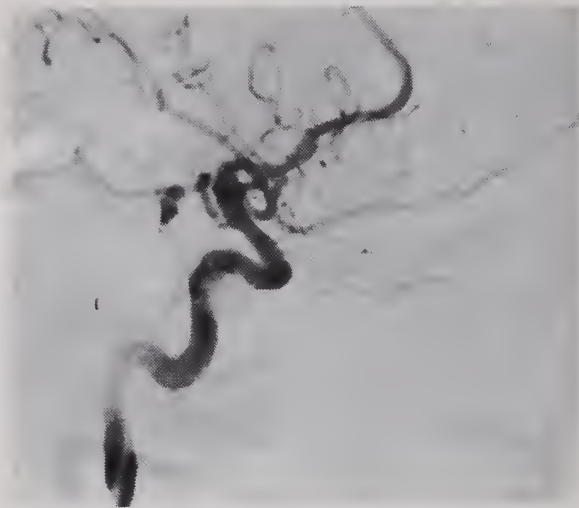


Fig. 2 (B) — Post occlusion lateral left internal carotid angiogram. Occlusion of the fistula is present with a normal configuration of the left internal carotid artery.

Case 2

A 58-year-old female was involved in a motor vehicle accident at which time she suffered a fractured skull and left epidural hematoma. One week later, she presented with pulsating exophthalmus, bruit, chemosis, and left IV and VI cranial nerve palsies, with marked left orbital pain. An internal carotid angiogram demonstrated a left carotid cavernous fistula (Figure 3 (A)). Again, a cut-down was performed on the internal carotid artery due to marked tortuosity of its proximal portion. The detachable balloon assembly passed easily through the fistula and was inflated with .3 ml of Metrizamide until the balloon produced cessation of cavernous sinus opacification. Moderate stenosis of the common carotid artery occurred which did not produce significant slowing of the intracranial flow (Figure 3 (B)). Slight deflation of the balloon decreased the carotid stenosis but allowed carotid cavernous sinus opacification and therefore the balloon was detached despite the carotid narrowing. The patient's severe retroorbital pain ceased with each inflation of the balloon and

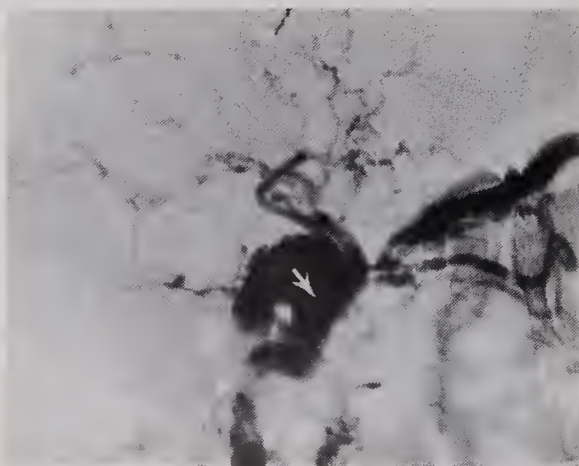


Fig. 3 (A) — Preocclusion lateral left internal carotid angiogram. A left carotid-cavernous fistula is present (arrow) with poor filling of the intracranial vasculature. The internal carotid artery (arrowhead) and superior ophthalmic vein (two arrowheads) are demonstrated.



Fig. 3 (B) — Post occlusion lateral left internal carotid angiogram. There is occlusion of the fistula with moderate stenosis of the adjacent internal carotid artery and good intracranial arterial filling.

immediately returned with balloon deflation. Three days following fistula occlusion, the patient's III nerve palsy partially resolved. At one month, no cranial nerve palsy was apparent and extraocular movements were normal. The balloon deflated between two weeks and one month post-embolization.

Case 3

This 28-year-old male was involved in a motorcycle accident in October of 1981 and suffered a depressed left parietal skull fracture and fractured femur. Three weeks later he noted a right cranial bruit with subsequent exophthalmus and scleral injection with dilatation of right forehead veins.

Angiographic evaluation demonstrated a right carotid cavernous fistula (Figure 4 (A)), rising from the posterior wall of the posterior ascending segment of the intracavernous carotid artery. The exact site of the fistula was determined by right vertebral injection with right common carotid compression. This causes retrograde flow to occur through the posterior communicating and internal carotid arteries to the site of the fistula (Figure 4 (B)). The site may also be demonstrated by right internal carotid injection with digital compression of the right common carotid artery to

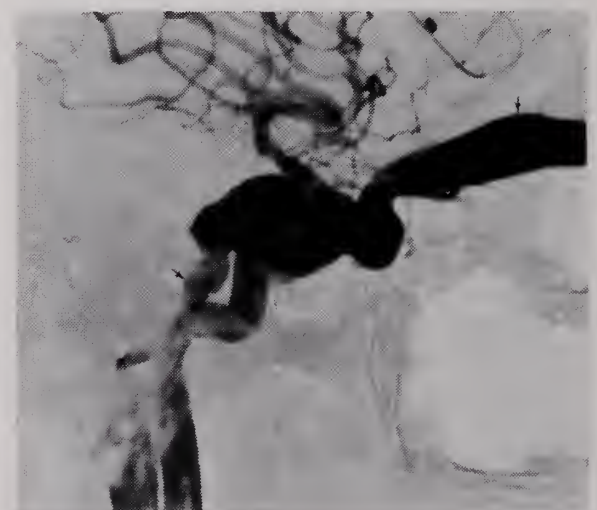


Fig. 4 (A) — Right internal carotid angiogram. A right carotid-cavernous fistula is present with superior orbital and inferior petrosal venous outflow (arrows).

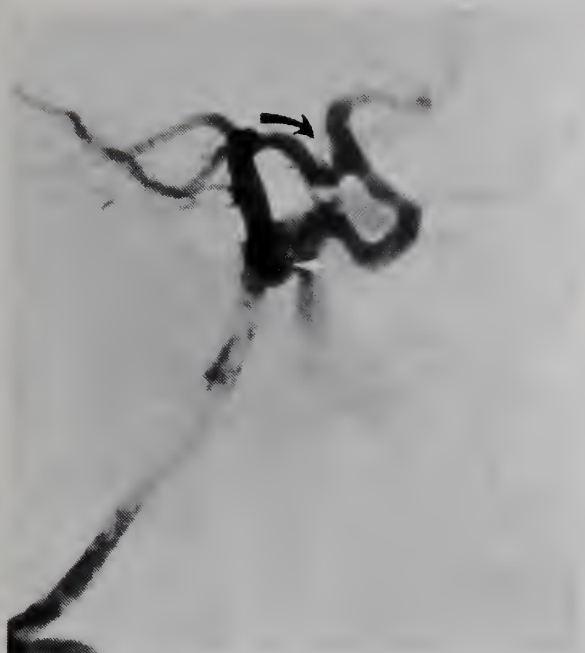


Fig. 4 (B) — Right vertebral angiogram with digital compression of right common carotid artery. Contrast flows in a retrograde fashion through the right posterior communicating and internal carotid arteries to demonstrate the fistula site (lower arrow).



Fig. 4 (C) — Right internal carotid angiogram with digital compression of right common carotid artery. The site of the fistula is demonstrated (arrow).

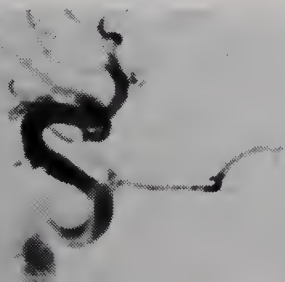


Fig. 4 (D) — Post occlusion right lateral internal carotid angiogram. Two balloons occlude the fistula with preservation of the carotid artery.

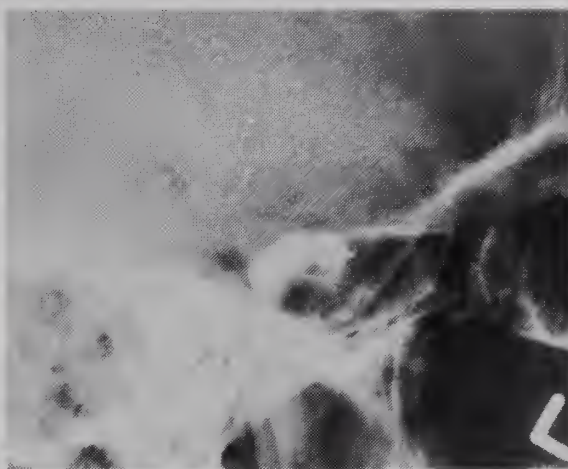


Fig. 4 (E) — Lateral skull film one week after placement. Metrizamide filled balloons remain fully inflated.



Fig. 4 (F) — Lateral skull film six weeks post occlusion. The balloons are deflated, but remain in place in the cavernous sinus.

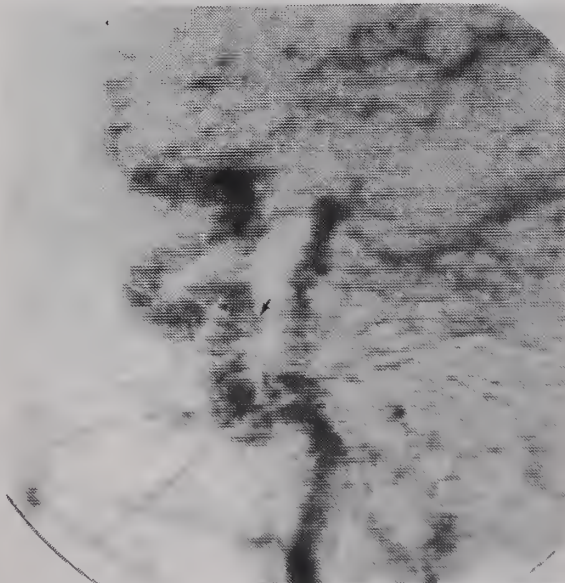


Fig. 4 (G) — Digital venous angiogram six weeks post occlusion. A small false aneurysm (arrow) is present at the site of the fistula.

decrease flow (Figure 4 (C)). Venous outflow was predominately through the hugely dilated superior ophthalmic vein and the inferior petrosal sinus. A number 9 balloon was placed in the cavernous sinus and tended to flow distally into the superior ophthalmic vein. This balloon was inflated and detached and used as a buttress for placement of a Number 16 balloon in the cavernous sinus and proximal superior ophthalmic vein. The carotid artery was preserved without stenosis (Figure 4 (D)). There was immediate cessation of the bruit with rapid decrease in exophthalmus. Partial right VI nerve palsy developed likely due to pressure of the balloons. At one week, the balloons were unchanged (Figure 4 (E)) in size with a slight increase in the VI nerve palsy and a partial right III nerve palsy and no change in the residual exophthalmus. These findings were likely due to cavernous sinus thrombosis about the inflated balloons. At one month, the balloons were deflated with minimal VI nerve palsy (Figure 4 (F)). Digital venous subtraction angiography at six weeks demonstrated a small false aneurysm at the fistula site (Figure 4 (G)). Clinical photographs show considerable improvement (Figures 4 (H) (I)).

Discussion

The present goal of treatment for carotid cavernous fistulas is occlusion of the fistula with preservation of the internal carotid artery. It must be remembered that this is not a life-threatening condition and therefore the treatment should be complete, with minimal morbidity and no mortality. The utilization of the detachable balloon system seems to be an appropriate modality for satisfying these goals. The largest experience to date, that of Debrun, et al., notes total fistula occlusion in 53 of 54 cases with asymptomatic angiographic leak in one patient.¹¹ The carotid blood flow was preserved in 59% of the cases. Three patients developed hemiparesis, two transient and one permanent. The permanent case occurred after surgical intracranial ligation of the internal carotid artery due to incomplete occlusion of the fistula produced by a balloon detached in the carotid artery. Oculomotor palsy, likely a result of compression by the balloon developed in 20 cases. In one case, there is residual permanent partial III nerve palsy. A false aneurysm occurred at the site of the fistula in 44% of the cases. This was due to the rapid deflation of the iodine-filled balloons. Most false aneurysms were small and asymptomatic. In five cases, the false aneurysms were large and produced severe headache. Treatment consisted of occlusion of the carotid artery and neck of the false aneurysm with a detachable balloon. The injection of silicone into the balloons decreased the size and frequency of development of false aneurysms.



Fig. 4 (H) — Preocclusion clinical photograph. Right proptosis and chemosis with bulging of the upper eyelid are present as well as dilatation of the forehead veins due to massive increased flow through the superior ophthalmic vein. (By permission)



Fig. 4 (I) — Post occlusion clinical photograph. Minimal right proptosis remains. Pupils are dilated following ophthalmologic examination. (By permission)

Other reports of complications arising from this procedure have included middle cerebral artery embolization, neck hematoma necessitating tracheostomy, balloon shrinkage due to filling with hypotonic Metrizamide and balloon rupture due to overfilling.¹⁴ These complications need not occur if proper anticoagulation and correct balloon filling procedures are utilized and the femoral route is employed.

At present, three types of detachable balloon systems are under investigation for the treatment of carotid cavernous fistulas. Further developments will facilitate easier balloon deposition and detachment with more permanent inflation. These changes in technology will improve upon a system which already has achieved wide-spread acceptance in the neurosurgical world for the treatment of carotid cavernous fistulas.

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- 8-14. Will be found on page 333.

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(BRIEF SUMMARY)

DESCRIPTION: Each tablet contains 200 mg meprobamate and 325 mg aspirin.

INDICATIONS: Adjunct in short-term treatment of pain accompanied by tension and/or anxiety in patients with musculoskeletal disease. Clinical trials demonstrated in these situations relief of pain is somewhat greater than with aspirin alone. Effectiveness in long-term use, i.e. over 4 months, has not been assessed by systematic clinical studies. Physicians should periodically reassess usefulness of drug for individual patients.

CONTRAINDICATIONS: ASPIRIN: Allergic or idiosyncratic reactions to aspirin or related compounds. MEPROBAMATE: Acute intermittent porphyria, allergic or idiosyncratic reactions to meprobamate or related compounds, e.g. carisoprodol, mebutamate, or carbamate.

WARNINGS: ASPIRIN: Use salicylates with extreme caution in patients with peptic ulcer, asthma, coagulation abnormalities, hypoprothrombinemia, vitamin K deficiency, or those on anticoagulants. In rare instances, aspirin in persons allergic to salicylates may result in life-threatening allergic episodes.

MEPROBAMATE: DRUG DEPENDENCE: Physical and psychological dependence, and abuse have occurred.

Chronic intoxication from prolonged ingestion of, usually, greater than recommended doses is manifested by ataxia, slurred speech, and vertigo. Therefore, carefully supervise dose and amounts prescribed and avoid prolonged use, especially in alcoholics and others with known propensity for taking excessive quantities of drugs. Sudden withdrawal after prolonged and excessive use may precipitate recurrence of preexisting symptoms, e.g. anxiety, anorexia, or insomnia, or withdrawal reactions, e.g. vomiting, ataxia, tremors, muscle twitching, confusional states, hallucinosis, and, rarely, convulsive seizures. Such seizures are more likely in persons with CNS damage or preexistent or latent convulsive disorders. Onset of withdrawal symptoms occurs usually within 12 to 48 hours after discontinuation, symptoms usually cease

within next 12- to 48-hour period. When excessive dosage has continued for weeks or months, reduce dosage gradually over 1 to 2 weeks rather than stop abruptly. Alternatively, a short-acting barbiturate may be substituted, then gradually withdrawn.

POTENTIALLY HAZARDOUS TASKS: Warn patients meprobamate may impair mental or physical abilities required for potentially hazardous tasks, e.g., driving or operating machinery.

ADDITIVE EFFECTS: Since CNS-suppressant effects of meprobamate and alcohol or meprobamate and other psychotropic drugs may be additive, exercise caution with patients taking more than one of these agents simultaneously.

USAGE IN PREGNANCY AND LACTATION: An increased risk of congenital malformations associated with minor tranquilizers (meprobamate, chloralhydrate, and diazepam) during first trimester of pregnancy, has been suggested in several studies. Because use of these drugs is rarely a matter of urgency, their use during this period should almost always be avoided. The possibility that a woman of child-bearing potential may be pregnant at time of institution of therapy should be considered. Advise patients if they become pregnant during therapy or intend to become pregnant to communicate with their physicians about desirability of discontinuing the drug.

MEPROBAMATE possesses the placental barrier. It is present both in umbilical cord blood of or near maternal plasma levels and in breast milk of lactating mothers of concentrations two to four times that of maternal plasma. When use of meprobamate is contemplated in breastfeeding patients, consider the drug's higher concentrations in breast milk as compared to maternal plasma levels. **USAGE IN CHILDREN:** Keep preparations with aspirin out of reach of children. Equagesic-M is not recommended for patients 12 years of age and under. **PRECAUTIONS:** ASPIRIN: Salicylates an-

tagonize uricosuric activity of probenecid and sulfinpyrazone. Salicylates are reported to enhance hypoglycemic effect of sulfonylurea antidiabetics.

MEPROBAMATE: Use lowest effective dose, particularly in elderly and/or debilitated, to preclude over-sedation. Meprobamate is metabolized in the liver and excreted by the kidney; to avoid excess accumulation exercise caution in its use in patients with compromised liver or kidney function. Meprobamate occasionally may precipitate seizures in epileptic patients. It should be prescribed cautiously and in small quantities to patients with suicidal tendencies.

ADVERSE REACTIONS: ASPIRIN: May cause epigastric discomfort, nausea, and vomiting. Hypersensitivity reactions, including urticaria, angioneurotic edema, purpura, asthma, and anaphylaxis may rarely occur. Patients receiving large doses of salicylates may develop tinnitus.

MEPROBAMATE: CNS: Drowsiness, ataxia, dizziness, slurred speech, headache, vertigo, weakness, paresthesias, impairment of visual accommodation, euphoria, overstimulation, paradoxical excitement, fast EEG activity. GI: Nausea, vomiting, diarrhea. CARDIOVASCULAR: Palpitation, tachycardia, various forms of arrhythmia, transient ECG changes, syncope, hypotensive crisis.

ALLERGIC OR IDIOSYNCRATIC: Milder reactions are characterized by itchy, urticarial, or erythematous maculopapular rash, generalized or confined to the groin. Other reactions include leukopenia, acute nonthrombocytopenic purpura, petechiae, ecchymoses, eosinophilia, peripheral edema, adenopathy, fever, fixed drug eruption with cross-reaction to carisoprodol, and cross-sensitivity between meprobamate/mebutamate and meprobamate/carbromal. Rare, more severe hypersensitivity reactions include hyperpyrexia, chills, angioneurotic edema, bronchospasm, oliguria and anuria. Also, anaphylaxis, exfoliative dermatitis, stomatitis, and proctitis. Stevens-Johnson syndrome and

bullous dermatitis have occurred. **HEMATOLOGIC (SEE ALSO "ALLERGIC OR IDIOSYNCRATIC"):** Agnucytosis, aplastic anemia have been reported, although no causal relationship has been established, and thrombocytopenic purpura.

OTHER: Exacerbation of porphyric symptoms.

DOSE AND ADMINISTRATION: Usual dose is one or two tablets, 3 to 4 times daily as needed for relief of pain when tension or anxiety is present. Not recommended for patients 12 years of age and under.

OVERDOSAGE: Treatment is essentially symptomatic and supportive. Any drug remaining in the stomach should be removed. Induction of vomiting or gastric lavage may be indicated. Activated charcoal may reduce absorption of both aspirin and meprobamate. Aspirin overdosage produces usual symptoms and signs of salicylate intoxication. Observation and treatment should include management of hyperthermia, specific parenteral electrolyte therapy for ketoacidosis and dehydration, watching for evidence of hemorrhagic manifestations due to hypoprothrombinemia which, if it occurs, usually requires whole-blood transfusions. Suicidal attempts with meprobamate have resulted in drowsiness, lethargy, stupor, ataxia, coma, shock, vasomotor and respiratory collapse. Some suicidal attempts have been fatal. The following data, reported in the literature and from other sources, are not expected to correlate with each case (considering factors such as individual susceptibility and length of time from ingestion to treatment), but represent usual ranges reported. Acute simple overdose (meprobamate alone): Death has been reported with ingestion of as little as 12 gram meprobamate and survival with as much as 40 gram.

BLOOD LEVELS: 0.5-2.0 mg percent represents usual blood-level range after therapeutic doses. The level may occasionally be as high as 3.0 mg percent. 3-10 mg percent usually corresponds to

findings of mild-to-moderate symptoms of overdosage, such as stupor or light coma.

10-20 mg percent usually corresponds to deeper coma, requiring more intensive treatment. Some fatalities occur. At levels greater than 20 mg percent, more fatalities than survivals can be expected.

Acute combined overdose (meprobamate with other psychotropic drugs or alcohol): Since effects can be additive, history of ingestion of a low dose of meprobamate plus any of these compounds (or of a relatively low blood or tissue level) cannot be used as a prognostic indicator.

In cases of excessive doses, sleep ensues rapidly and blood pressure, pulse, and respiratory rates are reduced to basal levels. Any drug remaining in stomach should be removed and symptomatic treatment given. Should respiration or blood pressure become compromised, respiratory assistance, CNS stimulants, and pressor agents should be administered cautiously as indicated. Diuresis, osmotic (mannitol) diuresis, peritoneal dialysis, and hemodialysis have been used successfully in removing both aspirin and meprobamate. Alkalinization of the urine increases excretion of salicylates. Careful monitoring of urinary output is necessary, and caution should be taken to avoid overhydration. Relapse and death, after initial recovery, have been attributed to incomplete gastric emptying and delayed absorption.

HOW SUPPLIED: Bottles of 50 scored tablets.

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Rheumatology Corner

Cardiac Involvement in Progressive Systemic Sclerosis (Scleroderma)

KAREN KLEIMAN, M.D.*

IN 1943 SOMA WEISS first described cardiac dysfunction in nine patients with scleroderma. His thoughts with respect to pathogenesis still encompass the continuing controversy, i.e., whether the primary pathogenesis of scleroderma reflects an abnormality of vasculature or collagen.

Symptoms suggestive of myocardial disease are common in scleroderma, but they may reflect esophageal spasm or reflux, restrictive lung disease, diffusion abnormalities, pulmonary hypertension, or renal disease, including hypertension or uremic pericarditis. Cardiac involvement has been reported to occur in from 20-80% of patients with scleroderma. Left sided heart failure and EKG abnormalities identify patients with the greatest chance of having severe myocardial lesions at autopsy.² These lesions are frequently asymptomatic until late in the course of the disease when they may become manifest with chest pain, exertional dyspnea, cardiomegaly, CHF, murmurs, conduction abnormalities, and pericardial disease. Pericarditis, occurring in 10-20% of patients with scleroderma commonly presents with an asymptomatic effusion, but may present with fever, chest pain, and a friction rub. The pericardial fluid is usually an exudate.⁴

Exertional and rest chest pain associated with ischemic EKG changes has been reported in scleroderma patients with normal coronary arteries.⁷ It has been attributed to pathology of the microcirculation in the myocardium. Some patients with scleroderma develop biventricular CHF in the absence of renal and pulmonary disease. Clinically the CHF is indistinguishable from ischemic cardiomyopathy in patients with coronary artery disease (CAD).

The causes of clinical heart failure in progressive systemic sclerosis are:

1. Left-sided heart failure
 - a. Primary myocardial PSS
 - b. Systemic hypertensive vascular disease

2. Right-sided congestive heart failure
 - a. Pulmonary parenchymal disease
 - b. Pulmonary hypertensive vascular disease
 - c. Pericardial constrictive disease.²

Conduction defects and arrhythmias are not uncommon in scleroderma. Roberts et al. reported serious arrhythmias in 62% including supraventricular tachycardia (32%), conduction disturbance (14%), bigeminy (20%) and ventricular tachycardia (10%). Of these 50 patients, only 22% had cardiac symptoms and the resting electrocardiogram was abnormal in only 32%, thus grossly underestimating cardiac involvement.⁹

In cardiac muscle cells, contraction band or reperfusion necrosis can be distinguished from coagulation necrosis secondary to permanent coronary artery occlusion by dense eosinophile transverse cytoplasmic bands that can be seen by light microscopy. It may be found in the hearts of patients with primary scleroderma cardiomyopathy suggesting transient interruption of blood flow or "Raynaud's of the heart" as one pathogenic mechanism. This is supported by a suggestion of microvascular slow flow seen with cold pressor thallium heart scans in some scleroderma patients.¹²

Sera from patients with scleroderma (and some patients with Raynaud's and other CTD) has been shown to have a cytotoxic effect on human endothelial cells and fibroblasts in vitro.¹⁰ Serum from patients with scleroderma may also select fibroblasts programmed to produce increased amounts of collagen.⁶

Specific therapy for scleroderma is dependent upon a clearer understanding of the pathogenesis of this disease, but some agents provide hope for clinical management. Captopril is an effective drug for the severe hypertension that may develop in patients with advanced disease. Calcium channel blocker may be useful in controlling Raynaud's including transient myocardial vascular compromise. Dr. Steen has found that D-penicillamine decreased the incidence of new visceral involvement and ASA and persantine may delay complications of microvascular disease.¹¹

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Book Review

Review of Medical Microbiology (15th ed.). E. Jawetz, J. L. Melnick, and E. A. Adelberg. Lange Medical Publications, Los Altos, California. 1982. 553 p., \$17.

Review of Medical Microbiology contains forty-one chapters, in which four authors participated, and is intended to be a comprehensive presentation of medical microbiology for the medical student, house officer, and practicing physician. This popular text has undergone biennial revisions since the first edition was published in 1954. The fifteenth edition is available in Spanish, German, French, Italian, Portuguese, Serbo-Croatian, Japanese, Polish, Albanian, and Indonesian translations.

The book is well written, accurate, contains many illustrations and diagrams and useful tables. Every chapter is well referenced listing several recent books, articles and reviews for further reading on selected areas. Chapter topics include microbial cell structure, metabolism and genetics, basic immunology and host-parasite relationships, bacterial pathogens, medical mycology, parasitology, and virology. Chapters are well organized and concisely written but unfortunately vary greatly in their quality.

A significant portion of this book is devoted to basic science aspects of microbiology including lengthy chapters on microbial metabolism, microbial genetics, viral replication and oncogenesis. These chapters provide more than an adequate review of these complex topics. Excellent illustrations guide one through microbial synthetic and fermentation pathways, transposable elements in prokaryotic and eukaryotic genes and molecular cloning of DNA. Charts summarizing viral classification systems, nucleic acid transcription, and viral replication are especially useful.

Parasitology was briefly covered in one chapter using limited text, illustrations and an effective summary chart. The summary chart, in particular, provides a well organized review of disease, parasite location in host, mode of transmission, geographic location, and therapy.

Anyone with any experience in medical mycology will find the chapter on this subject of limited use. Illustrations in this chapter are poor and summary charts, which appear throughout the rest of the text are absent.

I found the chapters concerning bacterial pathogens extremely brief, especially when compared to the multitude of pages devoted to viral pathogens. Virulence factors and antigenic structure are adequately summarized but this text cannot be

(Continued on page 316)

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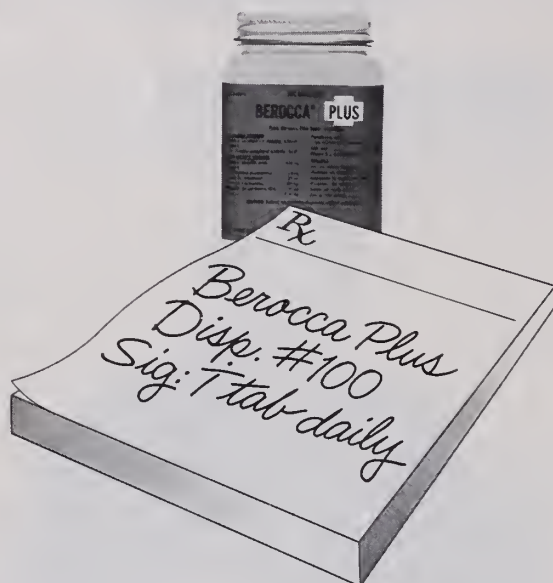
*Shaw S, Lieber CS: Nutrition and alcoholism, chap. 40, in *Modern Nutrition in Health and Disease*, edited by Goodhart RS, Shils ME: Philadelphia, Lea & Febiger, 1980, pp. 1220, 1237.

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(Book Review Continued)

suggested for reviewing available diagnostic techniques or therapy. Several bacterial microorganisms were inadequately discussed, most notably, a one-half page coverage of anaerobic species.

A great deal of effort was obviously put into the organization and brevity of this text. Despite the drawbacks cited, this text is appropriate for reviewing medical microbiology, especially the areas of microbial metabolism, genetics and virology. I would recommend this book for clinicians requiring an overview of medical microbiology, realizing this is not a definitive microbiology text.

Margie A. Morgan, Ph.D.
Postdoctoral Fellow
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Principals of Clinical Electrocardiography by Mervin J. Goldman; Clinical Prof Med, Univ of Cal, San Francisco. Lange Medical Publications, Los Altos, 1982 11th Edition, 438p.

It is evident throughout this eleventh edition of a standard electrocardiographic text that a thorough review has been accomplished since the last edition. Dr. Goldman uses words succinctly and illustrations profusely producing a total text of excellent heuristic value for all who wish to expand their knowledge of the human electrocardiogram. The greatest value of such a book as this is in the reference library and the ECG reading room of a hospital or physician's office. It is easy to see, reading the 11th why so many editions of this valuable text have appeared.

Reuben Berman, M.D.
Editor Emeritus



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MINNESOTA MEDICINE

Ghosts and the Black Box

CHARLES G. ROLAND, M.D.* AND JACK D. KEY, M.S.†

Naming is an activity riddled with hazards of many kinds, most of them social. We all dislike forgetting a person's name and many pretty schemes owe their invention to a very human desire never again to separate an acquaintance from his or her name. Will Shakespeare may be right in saying that "he that filches from me my good name robs me of that which not enriches him," but that is a calm and philosophic reflection. In a real meeting we all like to have our names remembered, and to remember those of others. When we cannot manage the latter feat we may mutter, with Mistress Page, "I cannot tell what the dickens his name is," and be uncharitably piqued with ourselves.

The social gaffe of forgetting a name is basic enough to warrant little more comment. But what of the related problem of wrong-naming? Common enough, too. Of course, we do not mean the mere slip of the tongue, which seldom attains the awful dimensions of a spoonerized Hoobert Heaver. Nor do we refer to the deliberate change — the pseudonym, the "artistic" name.

There remains, though, a category of wrong-nameness that occurs quite often, that wreaks havoc with our friends the librarians, and yet that irritates the one wrong-named not one whit. Of course, that is because the one misnamed does not exist. It is a ghost.

There are ghostly authors incarnate as the result of a wide variety of quite human misapprehensions. In scientific circles, perhaps the prototypical ghost was O. Uplavici, finally exorcised in 1938 after a vaporous and confusing existence of five decades. Dr. Uplavici (he began dispiritedly without a degree but acquired one by some later legerdemain) was the result of lamentable but entirely human ignorance. In 1887, a Czechoslovakian physician named Hlava published an important paper on dysentery. Somehow, while a blessedly anonymous abstracter was transferring some of the information about the contribution into an abstract in German (the scientific *lingua franca* of the day), the author's name vanished

and his article's title ("O Uplavici" — On Dysentery) was transmogrified into a name. No one saw any reason to question the name (although surely some Czechoslovakian reader must have found it piquant?) and it entered the sacred halls of the medical literature. From that domain it issued forth sporadically to demand its mote of immortality as a reference cited in some authoritative work or other — until Dobell ripped off the sheet in 1938 and disposed of that particular ghost.¹

But the wraithly ranks are undiminished. Consider just a few of the ghostly cognomens that haunt that most inviolable of scholarly preserves — The Literature.

An entire family of ghosts named Phil occupies a place, formalized by all the cybernetic bits that now verify an author's existence. But the Phils mock this procedure, for they do *not* exist. The most prolific, indubitably, is D. Phil. Glancing through recent issues of such scientific indexing tools as *Science Citation Index* and *Index Medicus* quickly establishes the commendable industry and versatility of this hardest-working Phil. There are dozens of citations. D. Phil, it seems, discourses on subjects recondite and multifarious: he (or she?) reports on mitochondrial changes in the heart muscle of the dog after certain treatments, and on tumor growth in mice, and on problems associated with caesarian operations, and even on the historical aspects of the Johns Hopkins Rechargeable Pacemaker. Surely renaissance man cannot be wholly extinct?

Moreover, D is but the most productive member of a talented family. M, presumably a sibling, turns up often enough so that we know of his interests in the effects of anesthesia on cell division, the potential of a drug to help rats and people who have hypertension, and the psychologic ramifications of abortion. And finally, another relative, Lic Phil has helped to write a paper on some esoteric aspect of genetics.

That is all we have to report on the Phil family at this time, although we believe that a more detailed search would reveal an even more impressive breadth to their accomplishments. But there are other prolific ghosts, including two more family groups that merit at least passing mention. These are the Chirs and the

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Paths. The first group includes B. Chir, M. Chir, M.B. Chir, and M.B.B. Chir (because of the initials, one might suppose the two last-named to be offspring of the other two Chirs). In the second group are M.R.C. Path and F.R.C. Path.

Finally, we have a miscellaneous set of ghosts, among whom we should mention M. Med, D. Orth, M. Rad, and at least one unquestionably feminine contributor — Ann Arbor.² In the same category as the last ghost — those whose names are geographically inspired — we must include B. Mawr³ and K. Lumpur.⁴

So here we have a gang of ghosts indeed. It's one thing to identify them. But what needs to be said of their life history? And how can we rid ourselves of them?

The unthinking black box is, of course, the chief, if indirect, cause. It can digest only what it is given. If the box is fed a citation that describes its authors as "Brown, J.M., D. Phil.," why should we be surprised when *Index Medicus* conveys the information that Brown and Phil coauthored the paper?^{5,6}

Some of these errors, then, are the fruit of human slips of the purely mechanical type. But others smack of an author's carelessness. And this fact provides a

suitable cue to display once again that splendid anecdote about Martin Joseph Routh's injunction. This aged gentleman, the President of Magdalen College, Oxford, was interviewed late in his life by J.W. Burgon.

A full year elapsed before I ventured to repeat the intrusion . . . I ventured to address him somewhat as follows: "Mr. President, give me leave to ask you a question I have sometimes asked of aged persons, but never of any so aged or so learned as yourself." He looked so kindly at me that I thought I might go on. "Every studious man, in the course of a long and thoughtful life, has had occasion to experience the special value of some axiom or precept. Would you mind giving me the benefit of such a word of advice?" He bade me to explain, evidently to gain time. I quoted an instance. He nodded and looked thoughtful. Presently he brightened up and said, "I think, sir, since you care for the advice of an old man, sir, you will find it a very good practice" (here he looked me in the face) "*always to verify your references, sir!*"⁷

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Sixth Annual Black Hills Seminar

The Sixth Annual Black Hills Seminar on Advances in Clinical Pediatrics — June 22, 23, 24, 1983, at Sylvan Lake Resort, Custer, South Dakota, sponsored by the Department of Pediatrics and Adolescent Medicine, University of South Dakota School of Medicine. Guest faculty include Drs. C. Warren Bierman, Alvin H. Jacobs, Melvin Levine and Philip Sunshine. For complete conference information contact:

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Minnesota Medical Association

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Each year at its annual meeting, the Minnesota Medical Association honors those members who have been in the practice of medicine for fifty years. Criteria for membership in the Fifty Club require that the physician has had a license to practice medicine for 50 years and has spent most of those 50 years in Minnesota. The Minnesota Medical Association extends its appreciation and congratulations to the following physicians, who will be recognized as new members of the Fifty Club on May 19, 1983:

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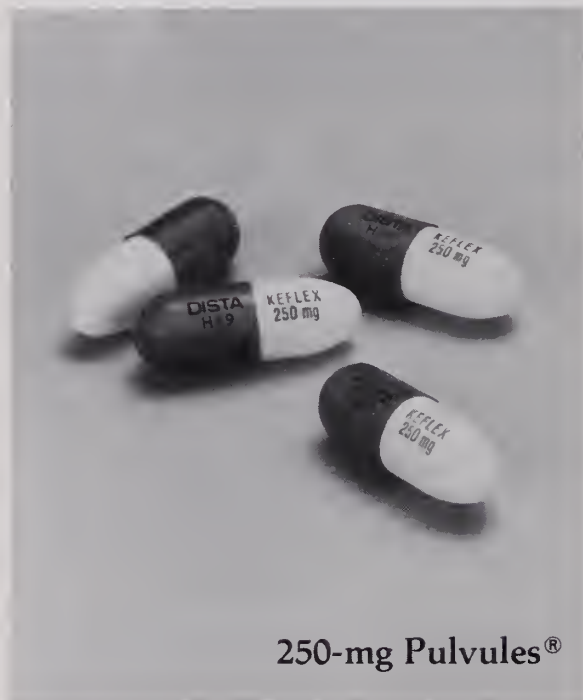
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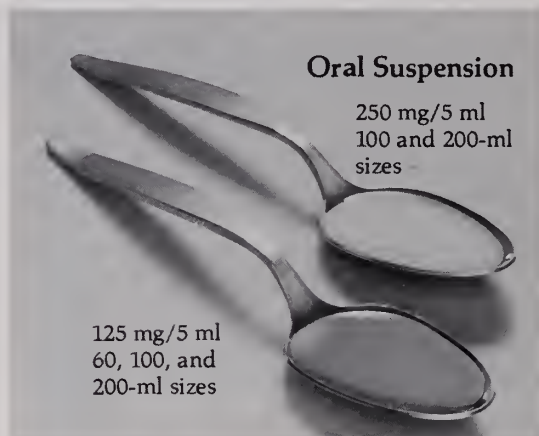
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Assay of 27 Antimicrobials Using A Microbiological Method

LANCE R. PETERSON, M.D.;* DALE N. GERDING, M.D.;* CLAUDINE E. FASCHING, M.T.;*
and CARLOS COSTAS-MARTINEZ, M.T.*

Clinical laboratories are often requested to perform assays for antimicrobial agents in specimens of serum and body fluid. These assays may be important to the assurance of adequate therapeutic drug concentrations and avoidance of toxicity. Microbiological assays are sufficiently versatile to be used for the assay of large numbers of antibiotics. In this paper we describe a standard microbiological assay method utilizing a choice of three assay organisms and three agar media. Each organism and media has been tested against 27 antimicrobials and the sensitivity of the assay method presented in tabular form. By maintaining a stock of three organisms and media, clinical and research laboratories should be able to assay the reported agents simply and economically.

THE AGAR DIFFUSION antibiotic bioassay method described by Sabath¹ using *Bacillus subtilis* ATCC 6633 is demonstrative of a common technique for assay of antimicrobial compounds. The technique relies on an antibiotic-sensitive indicator organism that is seeded into an agar base. Paper discs, which contain patient sample, are placed on the surface of hardened agar plates that contain the sensitive organism. The antibiotic in the sample diffuses into the agar and inhibits organism growth. The diameter of the zone of inhibition size is proportional to the concentration of antibiotic in the sample.² Many variables can affect inhibition zone diameter, including the specific indicator organism, the agar base used, and the sample itself.³⁻⁴

This paper describes an evaluation of nine combinations of three indicator organisms and three agar media for the assay of each of 27 antimicrobial drugs. The assay method was simplified so that each technique used approximately the same agar volume for each agar plate, and the same sample volume for all antimicrobials. The purpose of this report is to reduce the number of test variables inherent in this procedure, and to describe a reliable, versatile, yet simple reference table useful in large or small clinical microbiology and research microbiology laboratories for the assay of a wide range of antimicrobials.

Materials and Methods

Indicator Organisms

Staphylococcus aureus ATCC 6538P and *Micrococcus luteus* ATCC 9431 suspensions were prepared from organisms frozen on glass beads at -70°C by inoculation and overnight growth in flasks containing Trypticase soy broth (BBL, Cockeysville, Md.), mechanically shaken with 3-mm glass beads. The bacteria were grown in this manner to prevent clumping and give a more uniform dispersion of organisms in the seeded agar. One milliliter of a 1:10 dilution of each suspension was added to one liter of sterilized media cooled to 50°C . A suspension of *Bacillus subtilis* ATCC 6633 was prepared from a stock spore suspension (BBL) stored at 4°C . The latter was diluted in sterile distilled water 1:6 according to manufacturer's directions. One milliliter of this diluted spore suspension was added to one liter of sterilized media cooled to 50°C . When organisms were prepared using these directions the concentration of *S. aureus* or *M. luteus* was approximately 1×10^5 cfu/ml, and the concentration of *B. subtilis* was 3×10^5 cfu/ml of sterilized agar media.

Agar Plate Preparation

Three solid agar media, antibiotic media numbers 1, 5, and 11 (Difco Laboratories, Detroit, Mi.) were evaluated, having pH values of 6.6, 8.0 and 7.9 respectively. Media were prepared and sterilized according to manufacturer's instructions and cooled to 50°C . The indicator organisms were added to liquid

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agar medium, thoroughly mixed and then poured (6 ml) into 15 × 100 mm Petri dishes (Falcon, Becton, Dickinson, Cockeysville, Md.). The agar plates were left at room temperature to harden on a level surface and then stored at 4°C until used. Plates were stored for a maximum of 14 days.

Serum Samples

All antibiotic serum samples were prepared from stock solutions containing 1,000 mg/l of drug in deionized water, except for erythromycin which was dissolved in acetone. Antibiotics were added to pooled serum *in vitro* to give a concentration of 40 mg/l, and then further serially diluted to give concentrations from 20 mg/l to 0.078 mg/l.

Plate Sample Incubation

Samples of serum (20 µl) containing antibiotic were deposited on 6.35-mm diameter filter paper disks (Schleicher and Schuell, Inc., Keene, N.H.), using a 20 µl automatic pipetter. (MLA, Mount Vernon, N.Y.). Disks were then placed on the surface of the prepared seeded agar plates and incubated 24 h at 37°C. The diameter of the zone of inhibition around each disk was read with calipers and recorded to the nearest tenth of a millimeter. All samples were done in duplicate.

Results

The assay results for the three antibiotic media and the three indicator organisms for each antibiotic tested are shown in the Table. The lowest concentration for each antibiotic that gave a readable zone diameter is listed for each agar-indicator combination. Those combinations of organisms and media that could not detect concentrations of antimicrobial to the nearest 0.5 mg/l, in the range of 10 to 20 mg/l within the standard curve, are also indicated as unreliable due to an inaccurate estimation of most drug concentrations. The test conditions were considered satisfactory for gentamicin, neomycin and tobramycin if the assay could detect drug concentrations to the nearest 0.2 mg/l in the range from 1.25 to 10 mg/l.

Summary of Results

The major results are in the Table, so only a brief results section is given here.

Discussion

The antimicrobial activity of a variety of antibiotics can be assayed using the proper combination of organism and agar base. An appropriate agar medium and the selection of an indicator organism can be made by using the Table to determine what combinations are

maximally sensitive to the antibiotic of interest. Antibiotic assays using the described bioassay method can easily be done in most clinical microbiology laboratories, since these organisms and agar bases are readily available. One combination may be chosen which is sensitive to several commonly assayed drugs, to simplify plate preparation. Antibiotic concentrations in body fluids other than serum can be assayed by preparation of standards in the appropriate body fluid. This should be done in order to avoid errors introduced by differences in protein binding between standard solutions and patient samples.⁴ Should a given specimen contain more than one antibiotic, a method can be chosen that is selectively sensitive to the antibiotic of interest only. It is imperative that laboratories stress the need to know all antimicrobials contained in a specimen submitted for assay. Occasionally, antibiotic manipulation, e.g. by means of acidifying agar to pH 5.5 (for inactivation of aminoglycosides) or by addition of β-lactamase (for inactivation of penicillins and cephalosporins) may be applicable if no selective agar-organism combinations are found suitable. Standards for bioassays must be similar to the sample being assayed; whatever laboratory manipulations the sample goes through should also be applied to the standards. Sensitivity of the indicator organism to the antibiotic under study can be evaluated during each assay run by recording and monitoring the zone diameters obtained for each standard concentration in the antimicrobial standard curve.

Other excellent methods for antibiotic assay are available, but these suffer from either limited applicability to antimicrobial assay, or from requiring expensive equipment when only small numbers of determinations are performed. The additional methods utilized include high pressure liquid chromatography, and specific antibody-based systems, such as radioimmunoassay and enzyme immunoassay.⁵⁻⁷ These additional methods, especially high pressure liquid chromatography and radioimmunoassay, require extraction of the antibiotic from the specimen prior to assay. The disadvantage of high pressure liquid chromatography includes high equipment cost and the limited number of specimens that can be assayed per day. Liquid chromatography is very precise and reproducible with coefficients of variation usually less than 5%. The sensitivity of high pressure liquid chromatography is similar to that of microbiologic assay. Antibiotic measurements by radioimmunoassay and enzyme immunoassay are very rapid, sensitive, and specific. Their usefulness is limited by the availability of specific antibody, and to date have

ANTIMICROBIALS — PETERSON ET AL.

TABLE
Assay Sensitivity (in mg/l)

Drug	Agar No.	Indicator Organism		
		<i>B. subtilis</i>	<i>S. aureus</i>	<i>M. luteus</i>
Amikacin	1	(1.25)*	(5.0)	Zones blurred
	5	0.312	0.625	5.0
	11	(0.312)	(0.625)	(5.0)
Ampicillin	1	0.156	0.312	0.078
	5	0.156	0.156	0.156
	11	0.156	0.156	0.156
Cefaclor	1	0.625	1.25	0.312
	5	2.5	2.5	1.25
	11	2.5	1.25	0.625
Cefamandole	1	0.312	0.312	0.312
	5	0.312	0.312	0.625
	11	0.312	0.312	0.625
Cefazolin	1	1.25	0.625	10
	5	2.5	0.625	10
	11	2.5	0.625	10
Cefoxitin	1	2.5	5.0	5.0
	5	20	10	5.0
	11	10	10	5.0
Cephacetrile	1	1.25	0.625	10
	5	1.25	5.0	10
	11	1.25	5.0	10
Cephaloridine	1	0.156	0.078	0.312
	5	0.312	0.078	0.625
	11	0.312	0.078	0.312
Cephalothin	1	0.625	0.625	2.5
	5	0.625	1.25	2.5
	11	0.625	1.25	2.5
Cephapirin	1	0.312	0.312	0.625
	5	0.312	0.625	1.25
	11	0.312	0.625	1.25
Cephradine	1	1.25	1.25	0.156
	5	5.0	1.25	1.25
	11	5.0	1.25	0.625
Chloramphenicol	1	10	(20)	5.0
	5	10	(20)	10
	11	5.0	(20)	10
Clindamycin	1	5.0	0.625	0.312
	5	1.25	0.312	0.312
	11	1.25	0.312	0.312
Cloxacillin	1	2.5	0.312	5.0
	5	5.0	1.25	5.0
	11	5.0	1.25	2.5
Dicloxacillin	1	0.625	0.312	2.5
	5	2.5	0.625	2.5
	11	2.5	0.625	2.5
Erythromycin	1	0.625	0.625	0.312
	5	0.078	0.156	(0.078)
	11	0.078	0.312	0.078
Gentamicin	1	0.625	(1.25)	(20)
	5	0.312	0.312	1.25
	11	0.312	0.312	1.25
Kanamycin	1	(1.25)	(5.0)	Zones blurred
	5	0.625	(1.25)	NZ†
	11	(0.625)	(1.25)	NZ
Methicillin	1	1.25	2.5	0.625
	5	2.5	5.0	1.25
	11	1.25	2.5	1.25
Nafcillin	1	5.0	1.25	(0.625)
	5	10	1.25	(0.625)
	11	(20)	1.25	(0.625)
Neomycin	1	5.0	(20)	20
	5	0.312	0.625	(2.5)
	11	0.312	0.312	1.25
Oxacillin	1	5.0	1.25	0.625
	5	(5.0)	2.5	0.625
	11	(20)	1.25	(0.625)

(continued)

TABLE (continued)
Assay Sensitivity (in mg/l)

Drug	Agar No.	Indicator Organism		
		<i>B. subtilis</i>	<i>S. aureus</i>	<i>M. luteus</i>
Penicillin G	1	0.078	0.078	0.078
	5	0.078	0.156	0.156
	11	0.156	0.312	0.156
Streptomycin	1	(2.5)	(10)	NZ
	5	0.625	0.625	2.5
	11	0.625	1.25	(5.0)
Tetracycline	1	0.312	0.625	1.25
	5	2.5	5.0	10
	11	2.5	5.0	10
Tobramycin	1	0.625	(1.25)	NZ
	5	0.312	0.312	10
	11	0.312	0.312	10
Vancomycin	1	1.25	(5.0)	5.0
	5	2.5	(5.0)	10
	11	(2.5)	(5.0)	10

*Numbers in parenthesis () indicate combinations not recommended due to only slight increase in diameter in zone of inhibition with increasing drug concentration, thereby yielding poor estimation of accurate unknown antimicrobial concentration.

†NZ = no zones.

#Numerical figures in each column represent the lowest concentration of antibiotic which yielded discernible zones of inhibition.

usually been applied to assay of aminoglycosides, vancomycin or chloramphenicol.

We selected these three organisms through extensive experience with the bioassay method, and have compiled and used this Table in our laboratories for several years. We feel it provides a rapid and reliable

reference source for the expeditious assay of a broad range of antimicrobials by the microbiological assay method.

Acknowledgments

This work was supported by the Veterans Administration. The authors thank Evelyn C. Glatt for typing the manuscript.

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Headache Due to Spontaneous Low Spinal Fluid Pressure

C. CAMAK BAKER, M.D.*

Two patients with headaches due to spontaneous low spinal fluid pressure are described. Diagnosis and treatment are discussed. Etiology of the syndrome is unknown, but may be due to unrecognized tears in the arachnoid.

HHEADACHE, DUE to low spinal fluid pressure, is a familiar and characteristic syndrome. The condition is usually seen following diagnostic lumbar puncture or myelography. It has been shown to be due to persistent leakage of cerebrospinal fluid from the site of puncture of the subarachnoid space. An identical condition rarely occurs as a spontaneous event. The standard textbooks of Neurology have either nothing to say on the subject or the etiology is stated to be probable tears in the root sleeves resulting from a sneeze or sudden strain.¹ Although the condition is rare and quite unexpected in day-to-day practice, awareness of the condition leads to a relatively simple diagnosis and treatment. Two such patients are presented and the literature is updated.

Case Report

Case 1

A 39-year-old male was a laborer in a grain elevator. His past medical history was not remarkable. He was on no medication for any serious illness. He'd had a fairly sudden onset of severe headache about ten days prior to being seen. There was photophobia and an occipital head pain. The pain was definitely worse when he was upright. While on his feet, he was light-headed, he had mild nausea and felt as if he were about to faint. There was anorexia. He was much better when he was in bed. In fact, if he stayed in bed, the pain nearly completely subsided. Chiropractic treatment offered no help. His family physician treated him with Tetracycline and Dimetapp with a presumed diagnosis of frontal sinusitis, and the headache persisted.

The examination was that of a well-developed, well-nourished man who appeared acutely ill and pale. He appeared to be in fairly severe pain. He much preferred to lie down on the examining table rather than to sit to be examined. The ocular fundi showed no evidence of papilledema. The cranial nerve functions were intact. His pulse was 60 and blood pressure was 112/70. The remainder of his neurologic examination and general physical examination showed no abnormality.

Soon after admission to the hospital a lumbar puncture was done. There was no measurable pressure. The needle was repositioned by turning the bevel in various directions. Fluid was aspirated and sent to the laboratory. Although the fluid was clear and colorless, there were 21 white cells per cubic millimeter, 18 were polymorphonuclear leukocytes and 3 were monocytes. There were 43 red blood cells per cubic millimeter. The spinal fluid sugar was 60 mg/dl and protein was 60 mg/dl. Gram stain of the spinal fluid showed no bacteria and

culture of the fluid produced no bacterial growth in 48 hours. His urinalysis, complete blood count, plasma electrolytes and blood serology were all normal. Likewise, the serum calcium, phosphorous, glucose, BUN, uric acid, cholesterol, total protein, albumin, bilirubin, alkaline phosphatase, LDH and SGOT were within normal limits.

As instructed, the patient remained flat in bed over the next 24 hours and his headache was essentially gone. The following day he was able to sit up. The headache would recur but would go away very quickly when he would lie back down. Over the following days it was difficult to convince the patient to stay flat because he was feeling so well. On the other hand, every time he would sit up his headache would return.

The admission chest X-ray was normal. A computed tomogram of the head was done on May 1, 1980, and this was normal. Cervical, thoracic and lumbar spine X-rays made May 2nd, were also interpreted as normal.

On May 5th, radioisotope cisternography was carried out using DTPA labeled with 588 microcuries of YV-169. Imaging of the spine and the head was carried at 24 and 48 hours. The spinal fluid circulation appeared to be normal. There was no detectable leak along the dural sac. Because of persistent orthostatic headache an epidural blood patch was performed. That is, 10 milliliters of the patient's blood was injected into the lumbosacral epidural space, according to the technique described by Gormley.² On May 8th he was allowed to be up and walking. The headache did not recur and he was discharged. A follow-up phone call to the patient several weeks later revealed that he had no recurrence of his previous characteristic headache.

Case 2

A 54-year-old man was seen September 15, 1980. He had severe headaches for nearly one month. The pain was located in the occipital region, it was throbbing, incapacitating, and was made worse by movements of his head. His headaches occurred about 15 minutes after he got out of bed. They would go away completely, or nearly completely, about 20 minutes before he would lie down.

In late 1978 back pain had begun. A lumbar myelogram was done in May of 1979, showing a filling defect, characteristic of herniated nucleus pulposus at L4-5. An epidural blood patch was done to relieve a post-myelogram headache and this was successful. A laminectomy was done in October of 1979, but he had not returned to work and had received compensation. On the several visits to his orthopaedic surgeon, light-headedness and dizziness were common complaints, but there had been no headache mentioned until the present one began. He had surgery for a ureteral calculus in 1978 and he had been hospitalized for anterior chest wall pain that same year with no disease being found.

On present examination he appeared to be in acute distress. He was quite uncomfortable. His gait was antalgic and his back was stiff. There was no papilledema. Cranial nerve functions were normal. Blood pressure was normal. Post-surgery scars were well-healed and the remainder of the physical examination was

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normal. Complete blood count, urinalysis, and a multiple chemistry profile were normal. The blood serology was non-reactive.

Strict bedrest was enforced while he was hospitalized. After several days he was ambulated and the headache returned.

On September 25th a lumbar puncture was done. The spinal fluid pressure could not be measured since there was no flow into the manometer. Fluid was aspirated for the laboratory and radioisotope cisternography was initiated. The fluid contained four fresh red cells and no white cells. The spinal fluid sugar was 58 mg/dl. Protein was 61 mg/dl and serology was non-reactive. The cisternogram was normal. Imaging of the spine showed nothing unusual during the usual decay of the radioactive image.

Computed tomography of the lumbar spine showed evidence of the previous laminectomy on the right at L4-5 and there was some residual pantopaque. An aortic aneurysm measuring 3.3 cm. in diameter was also seen.

Three days after the cisternogram he was again allowed to be upright. The headache did not return. He was discharged and has not had recurrence of the headache.

Discussion

The primary site for the formation of spinal fluid appears to be the choroid plexus. These are extensions of the pia mater into certain parts of the roofs and walls of the ventricles. Some spinal fluid formation may also occur in perivascular spaces of the central nervous system, as well as from ependymal cells elsewhere in the ventricles. Circulation of the cerebrospinal fluid out of the ventricles and into the subarachnoid space is well documented. Most of the cerebrospinal fluid is absorbed from the arachnoidal villi into the intradural venous sinuses located along the superior sagittal sinus. Arachnoid villi and granulations have been found by Kido³ to be scattered throughout most of the nerve roots in the thoracic and lumbar area. He was able to identify three different types of arachnoid villi and granulations located in the region of the nerve root and distal root sleeve. The microscopic appearance of these smaller structures is basically the same as those along the superior sagittal sinus. They are closely associated with the spinal venous sinuses. They are felt to be important in the rapid disappearance of water soluble contrast material.

Schaltenbrand described the headache of spontaneous low CSF pressure in 1938⁴. He proposed three possible mechanisms to explain the pathophysiology: 1) Diminished production of CSF by the choroid plexus, 2) Hyper-reabsorption of CSF, and 3) CSF leakage through small tears. He termed the condition spontaneous *aliquorrhea*. Schaltenbrand postulated that spontaneous decrease or cessation of spinal fluid production was the result of a reversible disturbance of vasomotor function of the choroid plexus. He felt that an irritable vasomotor mechanism might exist in some individuals producing a spasm of the choroid plexus vessels. Toxic factors or infection might result in a similar phenomenon. The common finding of some

white blood cells in the spinal fluid was felt to support that theory.

Nosik⁵ reported a patient who developed symptoms of intracranial hypotension following a fall on her buttocks. Myelography showed contrast media streaming out of a tear in the dural sleeve of a lumbar nerve root. Five patients were reported by Lasater⁶. One of the patients was demonstrated to have a collection of protein-rich fluid in the subdural space suggesting that spinal fluid may have been leaking from a tear in the arachnoid. But a definite tear was not demonstrated. One of Lasater's patients had uncomplicated spontaneous intracranial hypotension and subsequently developed bilateral subdural hematomas. He emphasized the need for careful follow-up of patients with this disorder. Should the character of the headache change, studies appropriate for the detection of subdural hematoma should be done.

Labadie⁷ performed lumbar isotope cisternography in a 39-year-old woman who had spontaneously *hypoliquorrheic* headache. He showed that the radioactivity counts decreased very rapidly and this was accompanied by a simultaneous appearance of high isotope concentration in the urinary bladder. There was no evidence of any cerebrospinal fluid leakage at the puncture site. He felt that the syndrome was, therefore, caused by a very rapid absorption or unusual CSF leakage. If a tear were to exist in the root sleeve or in the arachnoid membrane the isotope might disappear very rapidly from the more vascular surrounding tissue and this would prevent a detection of this site of the leakage. It is conceivable that the arachnoid irritation from injection of the radioisotope-tagged albumen would be helpful in sealing off any possible tear. A relative pleocytosis does occur after isotope cisternography. In the cases reported here, a site of leakage could not be identified by cisternography. The technique used for the procedure at this institution does not allow a measurement of the relative rate of disappearance of the isotope.

The headache in one of these cases went away shortly after cisternography. In the other case the headache seemed to be "treated" by cisternography and epidural blood patch. The epidural blood patch was performed for possible leakage of CSF from the sites of previous lumbar puncture. The technique for epidural blood patch was described by Gormley² after he had a successful one performed on himself. Gormley observed that the incidence of post-puncture headache seemed to be lower after a traumatic lumbar puncture than after the uneventful puncture. Two to ten

milliliters of the patient's own blood is injected into the epidural space to create a "patch" at the site of CSF leakage. A special epidural needle may be employed. Or, a spinal needle can be inserted into the subarachnoid space; saline may be injected to bring the pressure to normal. Then the needle is withdrawn just enough that fluid no longer flows. The blood is then injected into the epidural space.

Harold Wolff⁸ did extensive studies on the headache of low spinal fluid pressure. He showed that headache could be regularly induced in the normal erect human subject by free drainage of approximately 22 cc. of CSF. He documented the postural changes that would relieve the headache. He showed that the headache could be augmented in intensity by distention of intracranial veins, secondary to bilateral jugular compression. The headache could be regularly relieved also by the intrathecal injection of physiologic solution of sodium chloride. He felt that there were two mechanisms producing the headache in this circumstance. The loss of spinal fluid would cause the loss of the normal buoyancy of the spinal fluid on the brain so that there was traction on the pain sensitive structures which anchor the brain to the cranium. These structures are primarily in the intracranial veins. There is a secondary increase in brain volume leading to a vasodilation headache.

A classification of the causes of low spinal fluid pressure headache might go as follows: (1) spontaneous or primary; (2) post-operative; (3) after head injury; (4) after lumbar puncture; and (5) after intercourse⁹. The clinical features of the syndrome are fairly crisp. The headache is described as located in either the frontal or the occipital area. Occasionally, a severe pain is felt in both ears. The pain is severe and not usually relieved by potent analgesics. Recumbency will relieve the headache and will usually relieve it completely — the patient being quite comfortable while staying flat in bed. Indeed, the most unique feature of the headache is its relationship to position. It is distinctly orthostatic. Vertigo is present along with nausea, vomiting, diaphoresis, and perhaps some neck rigidity. Schaltenbrand³ describes a bradycardia which he called "vasus pulse." Mental dullness, a cloudy sensorium, sometimes convulsions and psychiatric disturbances have been reported.

Examination of the spinal fluid by lumbar puncture establishes the diagnosis. Spinal fluid pressure in the range of 30 mm. is the usual finding. Less than 70 mm. pressure is considered sufficient for diagnosis. Bell¹⁰ presented three patients, in two of whom there was a distinct sucking noise made at the time of lumbar

puncture and later air was demonstrated in the lateral ventricles by Xray. This indicated that there was a negative pressure. Bell emphasized the need of aspirating the fluid in order to establish that the needle is indeed in the subarachnoid space. It is common to find red blood cells in the spinal fluid. It is felt that the red cells entered the spinal fluid by diapedesis. Normally, the spinal fluid pressure is just about equal to venous pressure but as spinal fluid pressure falls, venous distention occurs and diapedesis of red cells can also occur. Perhaps the same mechanism explains the moderate elevation of the spinal fluid protein that is a common finding.

The syndrome has a very good prognosis. Without any treatment it will be relieved in one to six weeks. Perhaps the simplest form of treatment is strict bedrest. Both of the patients in this report were completely relieved of the headache while in bed. Difficulty can be encountered in convincing an incredulous patient on the need for continued bed rest after the initial improvement of the headache. Diamond¹¹ favored the infusion of hypotonic saline into the subarachnoid space. His patients responded very nicely to that maneuver. That would certainly shorten the period of disability for the patient. Cerebral vasodilators have been proposed. Carbon dioxide inhalation can be used for that purpose. Pituitrin has also been mentioned as a possible useful drug. Labadie⁶ mentioned that in the 45 case reports he reviewed, there were three patients with either subdural hematoma or hygroma.

The pathophysiology of the intracranial hypotension remains unclear. Current evidence points toward spilling of spinal fluid through minute tears in the arachnoid. This mechanism has been clinically proven in only one patient, that reported by Nosik⁵. The cyst that was aspirated by Lasater⁶ was presumed to be due to a CSF leak. Schaltenbrand's⁴ second possible explanation of pathophysiology remains also a distinct possibility. Some altered function in the spinal arachnoid villi that was demonstrated by Kido³ could allow the escape of large amounts of CSF. This would be quickly picked up by the perispinal venous channels and dispersed, thus defying demonstration by myelography or by radioisotope cisternography. Demonstration of the etiology has not been possible in most cases with our present technology.

Conclusion

Headache due to spontaneous low spinal fluid pressure is an uncommon but clinically distinct syndrome. It has been called spontaneous aliquorrheic headache and spontaneous intracranial hypotension. Diagnosis is made by lumbar puncture; the fluid

pressure will be less than 70 mm. Red blood cells are often found in the fluid. A moderate elevation of the protein is found. Treatment consists of bedrest and may be augmented by a saline infusion into the subarachnoid space. At present, the etiology is

unknown. It may be due to an undetectable leak of spinal fluid from a minute tear in a spinal root sleeve, or, hyperabsorption at the spinal arachnoid villi might also explain the low pressure.

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Biosynthetic Human Insulin Study

Eli Lilly and Company is sponsoring a two-year study of Biosynthetic Human Insulin (BHI) at the St. Louis Park Medical Center, Minneapolis, MN. Donnell Etzwiler, M.D. is the Principal Investigator.

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Study on Migraines in Children

Drs. Karen Olness and John MacDonald are conducting a study on migraines in children. The study will last nine months per patient and may include drug therapy and relaxation and biofeedback exercises at no cost to the patient. The children must be between six to 13 years, of either sex, with a history of severe headaches over a four-month period, have an IQ greater than 70 by WISC Form R and have a normal neurological exam by a pediatrics neurologist at the beginning and end of the study. Excluded from the study will be children who have had prior experience with self hypnosis and those with a history of asthma, diabetes mellitus, or known hypoglycemia. If you know of a patient who would benefit from this research, please call Dr. MacDonald at 588-0661.

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History

Edward Jenner and the Advent of Vaccination

RAYMOND C. BONNABEAU, JR., M.D., Ph.D.*

SMALLPOX is a relatively new disease in a long list of medical problems that have plagued our bodies from antiquity. Like most diseases that are of an epidemic nature, it needed a critical number of people who were not immune to manifest itself. As long as man lived in a paleolithic culture, he remained relatively free of these epidemic infectious diseases. When, however, humans started to congregate in larger numbers, in urban areas along the Nile, in Mesopotamia, and the Orient, conditions became favorable for epidemic outbreaks.

Although smallpox was described by Ruffer in Egyptian mummy skin (XVIII and XX Dynasties), some doubt has been cast on his diagnosis at the present time. Smallpox is not mentioned in the Hippocratic corpus, nor is there evidence that the disease was prevalent in India or China during the same time frame.

There seems to be little doubt, however, that it established itself during the Christian era, appearing in China during the reign of Chien Wu (49 A.D.) It probably spread westward through the Roman Empire, the signs and symptoms described by Galen being highly suspicious of the disease. It then apparently died out, to reappear again in western Asia in the mid-sixth century, reaching Mecca about 570 A.D. The disease then reached Europe via the Arab invasion of North Africa and Spain in the eighth century.

Originally it appeared in England as a mild disease which (as with most infectious diseases) primarily affected children. In the early 17th century, however, the virulence of the outbreaks increased and it started to appear as devastating epidemics instead. During the 17th century, infectious diseases, especially smallpox, were the keystones of medical practice. The treatment of this malady initially was one of heat: heavy bedclothes, red coverings over the windows, stimulating cordials, no change of bed linens, and a resultant high mortality. A change came when Thomas Sydenham described hemorrhagic smallpox and recommended a change to a cool regimen, i.e., open windows with fresh air, minimal bedclothes, clean bed linen, and lots of oral fluids.

As the epidemics became worse throughout the 18th century, the first inroads into reducing the numbers of deaths from smallpox were undertaken by means of smallpox inoculation. In this method, material was taken from a pustule or vesicle of a diseased victim and placed on the scratched skin of the person to be inoculated, in an attempt to induce a mild form of the disease, which would confer immunity. While this method worked, it had two drawbacks: (1) It was fatal in one-to-two per cent of the cases, and (2) The infected (inoculated) person could (and did) cause the fullblown disease in susceptible people, and thus could be the cause of an epidemic. These objections would soon be remedied.

Edward Jenner was born in Berkeley in 1749, the third son of the town vicar, his mother being the daughter of the former vicar. In 1754, both of his parents died, and he was brought up by guardians. He first attended the Rev. Mr. Clissold's school at Wotton-under-Edge, and in 1757 he entered the Rev. Dr. Washbourn's grammar school in Cirencester, where he received a thorough grounding in the classics. During this period, he was intensely interested in the wildlife as well as the fossils present in the surrounding countryside.

At the age of twelve (1760), he was apprenticed to a surgeon, Mr. Daniel Ludlow, at Sodbury, near Bristol. He remained there for nine years until age 21. It was during that period that an incident occurred that impressed itself upon him, which was to have a profound effect later on. His mentor was engaged in inoculations since he was a surgeon, and while he was speaking of smallpox to a young woman who had come for medical advice, Jenner heard her say, "I cannot take it, for I have had cowpox."

At age 21, he became apprenticed to John Hunter in London (Hunter was 42), and in fact lived in Hunter's home, not only serving as Hunter's anatomical assistant, but developing a friendship that lasted until Hunter's death in 1793. In 1773, Jenner returned to Berkeley to resume the life of a country surgeon.

Throughout this entire time, Jenner continued to correspond with John Hunter, helping him with work he was doing with fat loss in hibernating hedgehogs, along with other projects that required animals not

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accessible to him in London. At one point, a rumor reached Hunter that Jenner had been married. When he found out that Jenner had, in fact, been jilted, he wrote to him, "Let her go, never mind her. I shall employ you with hedgehogs." Hunter was always blunt and a pragmatist.

Jenner also was busy with his own observations in natural history, prodded repeatedly by Hunter. One of these, a study with the young cuckoo, resulted in his being elected a Fellow of the Royal Society in 1788.

Jenner could count on Hunter for medical advice if it was needed. John was always to the point. When advice was asked by Jenner concerning a fungus infection on a young boy's head, John replied, "I would have you do nothing with the boy but dress him superficially: these funguses will die, and be damned to them, and drop off." It was during this time period (c. 1786) that Jenner made the association between coronary atherosclerosis and angina pectoris. The latter had originally been described by William Heberden on 21 July 1768, before the College of Physicians. Jenner's findings were presented at a meeting of the Gloucestershire Medical Society in May of 1788, along with other observations on angina by Caleb Parry. No doubt, Jenner's reticence had been due to the fact that John Hunter had been suffering from symptoms that were alarmingly similar, and he had not wanted to upset him.

Jenner had previously belonged to another local medical society which had met at an inn at Alveston called "The Ship." He had repeatedly spoken of the virtue of cowpox as a prophylaxis against smallpox at these meetings, and he had been warned to stop, since he would forfeit his membership if he continued to broach the subject. Perhaps he was the driving force behind this new society, which met at the Fleece Inn.

As a practicing surgeon, Jenner was familiar with and employed inoculation as a smallpox preventive, using the method described by Robert Sutton. This method took material from a smallpox vesicle on the fourth day, at a time when no pus was present, and placed it onto an area of lightly scratched skin; scratched so that no blood had been raised.

Jenner had noted cowpox disease, seen it transmitted to the hands of the local milkmaids, and, as previously noted, been apprised that people who had the malady could not contract smallpox.

Jenner felt that cowpox — and possibly smallpox — was generated by a disease of horses called "the grease." If an individual milked cows after dressing an infected horse's hooves, the disease would develop on the nipples of the animals as irregular pustules —

"a palish blue, or rather of a colour somewhat approaching to livid, and are surrounded by an erysipelatous inflammation." Thus, he wrote, "Joseph Merret, now an Under Gardner to the Earl of Berkeley, lived as a servant with a farmer near this place in the year 1770, and occasionally assisted in milking his master's cows. Several horses belonging to the farm began to have sore heels, which Merret frequently attended. The cows soon became affected with the Cow Pox, and soon after several sores appeared on his hands." A bout with cowpox, Jenner felt, after much thought and observation, would protect the person from ever developing smallpox. He wrote, "In April, 1795, a general inoculation taking place here, Merret was inoculated with his family; so that a period of twenty-five years had elapsed from his having the cowpox to this time. However, though the variolous matter was repeatedly inserted into his arm, I found it impracticable to infect him with it . . . During the whole time that his family had the Small Pox, one of whom had it very full, he remained in the house with them, but received no injury from exposure to the contagion." Jenner therefore wrote that, "The disease makes its progress from the horse to the nipple of the cow, and from the cow to the Human Subject . . . this person who has been thus affected is forever after secure from the infection of Small Pox."

Jenner felt this was the *true* cowpox which gave immunity, and not another form of disease that *spontaneously* appeared on the nipples of cows. This could be transmitted to milkers, but, he felt, did not transmit smallpox immunity. Therefore, he made the observation that the disease transmitted immunity only at certain stages.

Similarly, he noted that smallpox seemingly gave immunity to cowpox. "In the month of May, 1796, the Cow Pox broke out at Mr. Baker's, a farmer who lives near this place . . . The whole of this family, except Sarah Wynne, one of the dairy maids, had gone through the Small Pox." None of those who had experienced this smallpox were touched but, "Sarah Wynne, who never had the Small Pox . . . was affected . . . in so violent a degree, (with cowpox) that she was confined to her bed." On 28 March 1797, Jenner tried to inoculate her with smallpox, and she failed to develop the disease.

While smallpox prevented cowpox and vice-versa, cowpox did not seem to give permanent immunity and did not prevent another bout with cowpox, as he noted in another one of his patients: "In the year 1791 the Cow Pox broke out at another farm where he lived as a servant, and he became affected with it a second

time; and in the year 1794 he was so unfortunate as to catch it again."

Jenner's crucial experiment occurred in May of 1796, when he showed that immunity to smallpox was also carried through the human cowpox lesion. He used cowpox material from a dairy maid, Sarah Nelmes, and on 14 May 1796, inserted it into the arm of a young boy of eight years, James Phipps. The boy was then inoculated with smallpox on 1 July and again several months later, but without any disease developing.

Jenner submitted his material to the Royal Society, which sent it back, saying, "As he had gained some reputation by his former papers to the Royal Society, it was advisable not to present this, lest it should injure his established credit." Jenner then went ahead and published his material in book form, *An inquiry into the causes and effects of the variolae vaccinae*, in London in 1798.

Following the book's publication, vaccination quickly spread to America, pioneered by Dr. Benjamin Waterhouse, its safety blessed, as it were, by President Thomas Jefferson, who had his son vaccinated. In France, Napoleon ordered all of his soldiers vaccinated, and the Empress of Russia urged it on all of her subjects. Parliament voted Jenner £10,000 in 1802 and an additional £20,000 in 1807. In 1808, the National Vaccine Establishment was founded with Jenner as its head. Although he had moved to London in 1802, by 1803 he had moved back to Berkeley and as he said, "Have again commenced (to be a) village doctor." He died of a stroke in 1823.

Despite recent adverse criticism, I think Jenner's work still stands as a monumental epic in the human conquest of disease. In short, as Columbus did, he showed the way.

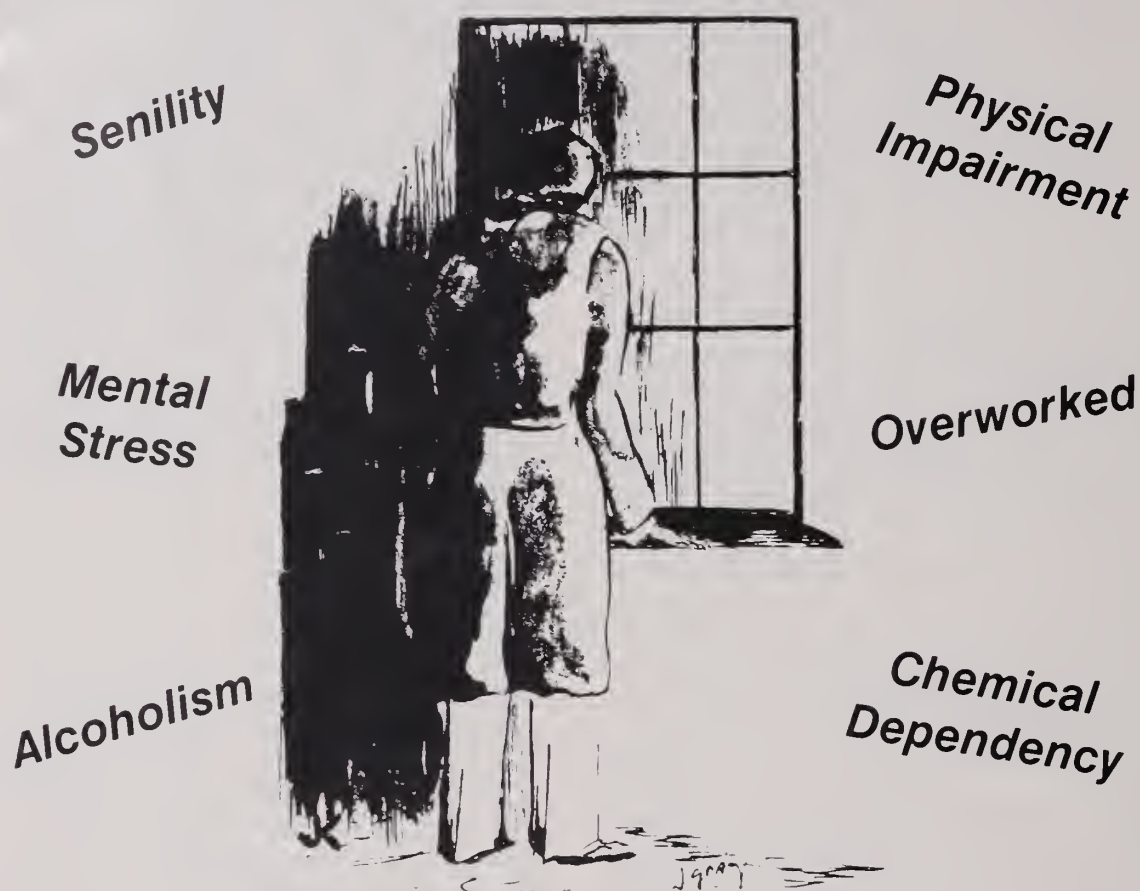
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DO YOU KNOW A DISABLED DOCTOR?



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**Thomas Briggs, M.D.
Impaired Physicians Committee
MINNESOTA MEDICAL ASSOCIATION
(612) 378-1875 or 777-8149**

CONFIDENTIAL, CONCERNED ADVOCACY

Anxious patients improve in just a few days

And what is more reassuring to an excessively anxious patient than medication that promptly starts to relieve his discomforting symptoms? Valium® (diazepam/Roche) begins working within 30 to 90 minutes. Patients continue to improve in just a few days, and relief continues throughout the course of treatment.

There are other important benefits with Valium as well—along with its broad clinical range, Valium has an efficacy/safety profile that few, if any, drugs can match. This record has been achieved with extensive clinical experience, undoubtedly including yours. And, as you must have observed, side effects more serious than drowsiness, fatigue or ataxia rarely occur. Nevertheless, as with any CNS-acting agent, patients should be cautioned about driving, operating hazardous machinery or ingesting alcohol or other CNS-depressant drugs while taking Valium.

Yet another benefit Valium affords is flexibility.






Available in 2-mg, 5-mg and 10-mg scored tablets, Valium enables you to titrate dosage to individual patient needs. For the geriatric patient, a starting dosage of 2 to 2½ mg once or twice a day is recommended. And, for patients who forget or skip medication, you can prescribe Valrelease™ (diazepam/Roche) 15-mg slow-release capsules,

knowing that Valrelease will assure all the benefits of Valium 5 mg *t.i.d.* with the convenience of once-a-day dosage.

Discontinuation of Valium (or Valrelease) is typically as smooth as its start in short-term therapy. However, Valium and Valrelease should be discontinued gradually after more extended treatment. As you diminish dosage, the built-in tapering action of Valium and Valrelease will help avoid rapidly recurring anxiety symptoms and symptoms of withdrawal, and will help ease the patient's transition to independent coping when therapeutic goals have been achieved.

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Valrelease™ (diazepam/Roche)  slow-release Capsules
Injectable Valium® (diazepam/Roche) 

Before prescribing, please consult complete product information, a summary of which follows:

Indications: Management of anxiety disorders, or short-term relief of symptoms of anxiety. Anxiety or tension associated with the stress of everyday life usually does not require treatment with an anxiolytic. Symptomatic relief of acute agitation, tremor, impending or acute delirium tremens and hallucinosis due to acute alcohol withdrawal; adjunctively in: relief of skeletal muscle spasm due to reflex spasm to local pathology; spasticity caused by upper motor neuron disorders; athetosis; stiff-man syndrome. *Oral forms* may be used adjunctively in convulsive disorders, but not as sole therapy. *Injectable form* may also be used adjunctively in: status epilepticus; severe recurrent seizures; tetanus; anxiety, tension or acute stress reactions prior to endoscopic/surgical procedures; cardioversion.

The effectiveness of diazepam in long-term use, that is, more than 4 months, has not been assessed by systematic clinical studies. The physician should periodically reassess the usefulness of the drug for the individual patient.

Contraindications: Tablets or capsules in children under 6 months of age; known hypersensitivity; acute narrow angle glaucoma; may be used in patients with open angle glaucoma who are receiving appropriate therapy.

Warnings: As with most CNS-acting drugs, caution against hazardous occupations requiring complete mental alertness (e.g., operating machinery, driving). Withdrawal symptoms similar to those with barbiturates and alcohol have been observed with abrupt discontinuation, usually limited to extended use and excessive doses. Infrequently, milder withdrawal symptoms have been reported following abrupt discontinuation of benzodiazepines after continuous use, generally at higher therapeutic levels, for at least several months. After extended therapy, gradually taper dosage. Keep addiction-prone individuals (drug addicts or alcoholics) under careful surveillance because of predisposition to habituation/dependence.

Use in Pregnancy: Use of minor tranquilizers during first trimester should almost always be avoided because their use is rarely a matter of urgency and because of increased risk of congenital malformations, as suggested in several studies. Consider possibility of pregnancy when instituting therapy; advise patients to discuss therapy if they intend to or do become pregnant.

ORAL. Advise patients against simultaneous ingestion of alcohol and other CNS depressants.

Not of value in treatment of psychotic patients; should not be employed in lieu of appropriate treatment. When using oral forms adjunctively in convulsive disorders, possibility of increase in frequency and/or severity of grand mal seizures may require increase in dosage of standard anticonvulsant medication; abrupt withdrawal in such cases may be associated with temporary increase in frequency and/or severity of seizures.

INJECTABLE *To reduce the possibility of venous thrombosis, phlebitis, local irritation, swelling and, rarely, vascular impairment when used IV: inject slowly; taking at least one minute for each 5 mg (1 ml) given, do not use small veins, i.e., dorsum of hand or wrist, use extreme care to avoid intra-arterial administration or extravasation. Do not mix or dilute with other solutions or drugs in syringe or infusion flask. If it is not feasible to administer Injectable Valium directly IV, it may be injected slowly through the infusion tubing as close as possible to the vein insertion.*

Administer with extreme care to elderly, very ill, those with limited pulmonary reserve because of possibility of apnea and/or cardiac arrest; concomitant use of barbiturates, alcohol or other CNS depressants increases depression with increased risk of apnea; have resuscitative facilities available. When used with narcotic analgesic eliminate or reduce narcotic dosage at least 1/3, administer in small increments. Should not be administered to patients in shock, coma, acute alcoholic intoxication with depression of vital signs.

Has precipitated tonic status epilepticus in patients treated for petit mal status or petit mal variant status. Not recommended for OB use.

Efficacy/safety not established in neonates (age 30 days or less); prolonged CNS depression observed. In children, give slowly (up to 0.25 mg/kg over 3 minutes) to avoid apnea or prolonged somnolence; can be repeated after 15 to 30 minutes. If no relief after third administration, appropriate adjunctive therapy is recommended.

Precautions: If combined with other psychotropics or anticonvulsants, carefully consider individual pharmacologic effects—particularly with known compounds which may potentiate action of diazepam, i.e., phenothiazines, narcotics, barbiturates, MAO inhibitors and antidepressants. Protective measures indicated in highly anxious patients with accompanying depression who may have suicidal tendencies. Observe usual precautions in impaired hepatic function; avoid accumulation in patients with compromised kidney function. Limit oral dosage to smallest effective amount in elderly and debilitated to preclude ataxia or over-sedation (initially 2 to 2½ mg once or twice daily, increasing gradually as needed and tolerated).

The clearance of diazepam and certain other benzodiazepines can be delayed in association with Tagamet (cimetidine) administration. The clinical significance of this is unclear.

INJECTABLE Although promptly controlled, seizures may return; readminister if necessary; not recommended for long-term maintenance therapy. Laryngospasm/increased cough reflex are possible during peroral endoscopic procedures; use topical anesthetic, have necessary countermeasures available. Hypotension or muscular weakness possible, particularly when used with narcotics, barbiturates or alcohol. Use lower doses (2 to 5 mg) for elderly/debilitated.

Adverse Reactions: Side effects most commonly reported were drowsiness, fatigue, ataxia. Infrequently encountered were confusion, constipation, depression, diplopia, dysarthria, headache, hypotension, incontinence, jaundice, changes in libido, nausea, changes in salivation, skin rash, slurred speech, tremor, urinary retention, vertigo, blurred vision. Paradoxical reactions such as acute hyperexcited states, anxiety, hallucinations, increased muscle spasticity,

insomnia, rage, sleep disturbances and stimulation have been reported, should these occur, discontinue drug.

Because of isolated reports of neutropenia and jaundice, periodic blood counts, liver function tests advisable during long-term therapy. Minor changes in EEG patterns, usually low-voltage fast activity, observed in patients during and after diazepam therapy are of no known significance.

INJECTABLE Venous thrombosis/phlebitis at injection site, hypoactivity, syncope, bradycardia, cardiovascular collapse, nystagmus, urticaria, hiccups, neutropenia. In peroral endoscopic procedures, coughing, depressed respiration, dyspnea, hyperventilation, laryngospasm/pain in throat or chest have been reported.

Dosage: Individualize for maximum beneficial effect.

ORAL: Adults: Anxiety disorders, relief of symptoms of anxiety—Valium (diazepam/Roche) **tablets**, 2 to 10 mg b.i.d. to q.i.d.; or 1 or 2 Valrelease **capsules** (15 to 30 mg) daily. Acute alcohol withdrawal—**tablets**, 10 mg t.i.d. or q.i.d. in first 24 hours, then 5 mg t.i.d. or q.i.d. as needed; or 2 **capsules** (30 mg) the first 24 hours, then 1 **capsule** (15 mg) daily as needed. Adjunctively in skeletal muscle spasm—**tablets**, 2 to 10 mg t.i.d. or q.i.d.; or 1 or 2 **capsules** (15 to 30 mg) once daily. Adjunctively in convulsive disorders—**tablets**, 2 to 10 mg b.i.d. to q.i.d.; or 1 or 2 **capsules** (15 to 30 mg) once daily.

Geriatric or debilitated patients: **Tablets**—2 to 2½ mg 1 or 2 times daily initially, increasing as needed and tolerated (see Precautions). **Capsules**—1 capsule (15 mg) daily when 5 mg oral Valium has been determined as the optimal daily dose.

Children: **Tablets**—1 to 2½ mg t.i.d. or q.i.d. initially, increasing as needed and tolerated (not for use in children under 6 months). **Capsules**—1 capsule (15 mg) daily when 5 mg oral Valium has been determined as the optimal daily dose (not for use in children under 6 months).

INJECTABLE Usual initial dose in older children and adults is 2 to 20 mg I.M. or I.V., depending on indication and severity. Larger doses may be required in some conditions (tetanus). In acute conditions injection may be repeated within 1 hour, although interval of 3 to 4 hours is usually satisfactory. Lower doses (usually 2 to 5 mg) with slow dosage increase for elderly or debilitated patients and when sedative drugs are added. (See Warnings and Adverse Reactions.) For dosages in infants and children see below; have resuscitative facilities available.

I.M. use: by deep injection into the muscle.

I.V. use: inject slowly; take at least one minute for each 5 mg (1 ml) given. Do not use small veins, i.e., dorsum of hand or wrist. Use extreme care to avoid intra-arterial administration or extravasation. Do not mix or dilute Valium with other solutions or drugs in syringe or infusion flask. If it is not feasible to administer Valium directly IV, it may be injected slowly through the infusion tubing as close as possible to the vein insertion.

Moderate anxiety disorders and symptoms of anxiety, 2 to 5 mg I.M. or I.V., and severe anxiety disorders and symptoms of anxiety, 5 to 10 mg I.M. or I.V., repeat in 3 to 4 hours if necessary; acute alcohol withdrawal, 10 mg I.M. or I.V. initially, then 5 to 10 mg in 3 to 4 hours if necessary. Muscle spasm, in adults, 5 to 10 mg I.M. or I.V. initially, then 5 to 10 mg in 3 to 4 hours if necessary (tetanus may require larger doses); in children administer I.V. slowly; for tetanus in infants over 30 days of age, 1 to 2 mg I.M. or I.V., repeat every 3 to 4 hours if necessary; in children 5 years or older, 5 to 10 mg repeated every 3 to 4 hours as needed. Respiratory assistance should be available.

Status epilepticus, severe recurrent convulsive seizures (I.V. route preferred), 5 to 10 mg adult dose administered slowly, repeat at 10- to 15-minute intervals up to 30 mg maximum. Repeat in 2 to 4 hours if necessary, keeping in mind possibility of residual active metabolites. Use caution in presence of chronic lung disease or unstable cardiovascular status. Infants (over 30 days) and children (under 5 years), 0.2 to 0.5 mg slowly every 2 to 5 min., up to 5 mg (I.V. preferred). Children 5 years plus, 1 mg every 2 to 5 min., up to 10 mg (slow I.V. preferred); repeat in 2 to 4 hours if needed. EEG monitoring may be helpful.

In endoscopic procedures, titrate I.V. dosage to desired sedative response, generally 10 mg or less but up to 20 mg (if narcotics are omitted) immediately prior to procedure; if I.V. cannot be used, 5 to 10 mg I.M. approximately 30 minutes prior to procedure. As preoperative medication, 10 mg I.M.; in cardioversion, 5 to 15 mg I.V. within 5 to 10 minutes prior to procedure. Once acute symptomatology has been properly controlled with injectable form, patient may be placed on oral form if further treatment is required.

Management of Overdosage: Manifestations include somnolence, confusion, coma, diminished reflexes. Monitor respiration, pulse, blood pressure; employ general supportive measures, I.V. fluids, adequate airway. Use levaterenol or metaraminol for hypotension. Dialysis is of limited value.

How Supplied:

ORAL Valium scored tablets—2 mg, white; 5 mg, yellow; 10 mg, blue—bottles of 100 and 500; Prescription Paks of 50, available in trays of 10; Tel-E-Dose® packages of 100, available in trays of 4 reverse-numbered boxes of 25 and in boxes containing 10 strips of 10.

Valrelease (diazepam/Roche) slow-release capsules—15 mg (yellow and blue), bottles of 100; Prescription Paks of 30.

INJECTABLE: Ampuls, 2 ml, boxes of 10; Vials, 10 ml, boxes of 1; Tel-E-Ject® (disposable syringes), 2 ml, boxes of 10. Each ml contains 5 mg diazepam, compounded with 40% propylene glycol, 10% ethyl alcohol, 5% sodium benzoate and benzoic acid as buffers, and 1.5% benzyl alcohol as preservative.



MINNESOTA MEDICAL ASSOCIATION 1983 ANNUAL MEETING
Wednesday-Friday, May 18-20, Radisson South Hotel, Bloomington

If you have not already registered for the Annual Meeting please do so at the on-site registration desk.

SCHEDULE OF EVENTS:

Wednesday, May 18, 1983

7:00 a.m. Reference Committee Orientation Breakfast Meeting
7:30 a.m. County Society Caucuses
8:00 a.m. Registration
9:45 a.m. House of Delegates (Session I)
10:00 a.m. Auxiliary Pre-Convention Meeting
12:30 p.m. Auxiliary Luncheon (Mai Tai, Excelsior) and tour of Excelsior
12:30 p.m. Specialty Societies Caucus
12:30 p.m. Delegates' Luncheon
2:00 p.m. Reference Committees
2:00 p.m. Financial Planning Seminar

Thursday, May 19, 1983

7:00 a.m. Registration
7:00 a.m. Breakfast Meetings
7:30 a.m. Prayer Breakfast
7:30 a.m. MINNPAC Annual Meeting
8:00 a.m. Exhibits and Art Show
8:00 a.m. Auxiliary Past Presidents Breakfast
8:30 a.m. Scientific Program
9:00 a.m. Auxiliary Annual Meeting (Minikahda Country Club)
11:30 a.m. County Society and Outstate Delegate Caucuses
11:30 a.m. Indoor Picnic
12:00 noon Minnesota International Health Volunteers Luncheon

1:30 p.m. Scientific Program
2:00 p.m. House of Delegates (Session II)
5:00 p.m. Association of Neurologists of Minnesota Meeting
7:00 p.m. President's Reception
8:00 p.m. Banquet

Friday, May 20, 1983

7:00 a.m. Registration
8:00 a.m. Exhibits and Art Show
8:30 a.m. Scientific Program*
11:30 a.m. Indoor Picnic
12:00 noon Environmental Health CME Program
12:00 noon Minnesota Women Physicians' Luncheon
12:00 noon Minnesota Chapter, American College of Emergency Physicians Luncheon Meeting
12:00 noon Resident/Medical Student Program
12:00 noon Minnesota Medical Computing Consortium Luncheon/Organizational Meeting
1:30 p.m. Scientific Program*
6:30 p.m. Minnesota Academy of Ophthalmology and Otolaryngology Dinner Meeting (Edina Country Club)

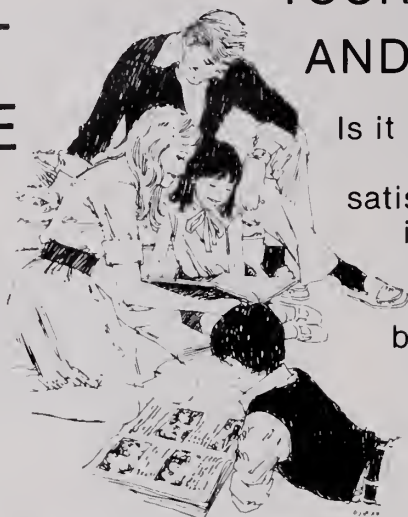
*8:30 a.m.-5:00 p.m.: There will be a continuous showing of video tapes on Chemical Abuse. This will be open for everyone and at no fee.

All events will be held at the
Radisson South Hotel unless otherwise indicated.

FOR FURTHER INFORMATION CALL OR WRITE:

Eugenia C. Kassar
Department of Education and Specialty Affairs
Minnesota Medical Association
2221 University Avenue S.E., #400
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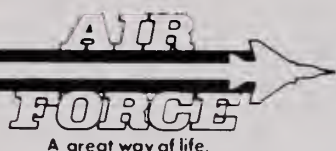


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Minnesota Medical Association

Retired Lives Reserve

WILLIAM P. SQUIRE, JR.*

The Minnesota Medical Association has recently endorsed a new benefit plan for Association members called RETIRED LIVES RESERVE. This is the only tax advantaged method available to continue group term life insurance after a physician retires. Group term life insurance is almost always terminated either at or shortly after retirement and if a physician dies after retirement (usually the case), his family is left without the group term life benefit. RETIRED LIVES RESERVE is an annual funding program accomplished during a physician's working lifetime to provide enough money at retirement to continue paying premiums on the group term policy until he dies. RETIRED LIVES RESERVE converts a terminable benefit into one that is guaranteed and permanent.

RETIRED LIVES RESERVE has four tax advantages: 1. The deposits placed in the reserve fund are tax deductible to the corporation. 2. The interest earnings on the reserve fund are not taxed as income to the physician. 3. The proceeds at death pass income tax free to the beneficiary. 4. If a spouse or trust is named the beneficiary, the proceeds avoid Federal Estate Taxes.

This is the only property afforded all four tax advantages by the Internal Revenue Code. These powerful tax advantages make RETIRED LIVES RESERVE plans particularly attractive for physicians.

Because of the changes under the new "Tax Equity and Fiscal Responsibility Act" of 1982 (TEFRA), any benefit over \$100,000 from qualified pension or profit sharing plans are now subject to Federal Estate Taxes and current tax rates could claim about half of the retirement plan(s) proceeds. Thus, if conventional life insurance is in a qualified retirement plan, its proceeds will be subject to Federal Estate Tax erosion. This would not be the case with RETIRED LIVES RESERVE, where effective planning will avoid the Federal Estate Tax on death benefits.

A qualified pension or profit sharing plan tied together with a RETIRED LIVES RESERVE plan is the answer because it will provide permanent life insurance benefits and eliminate the problem caused by conventional life insurance. RETIRED LIVES RESERVE gives the physician the economy of term insurance with the permanency of whole life insurance. The economy is magnified with tax deductible premiums and tax free growth. At retirement, the life insurance is paid in full and is perpetuated — not cancelled or transferred to the physician causing a monetary burden. Unlike qualified retirement plan benefits, the death benefit of a RETIRED LIVES RESERVE plan is received by the physician's beneficiary free of income tax.

The "Tax Equity and Fiscal Responsibility Act" of 1982 (TEFRA) has also imposed serious limitations on the annual contributions and ultimate payout benefits of qualified retirement plans. Restrictions have also been placed on so-called "top heavy" plans. These new statutory limitations will have a restrictive effect on many plans which have favored the highly compensated physician. As a result, there should be an abundance of funds available, which in the past went to contributions to qualified plans, and now presumably will have no place to go.

But these released funds will have a place to go; namely, into a RETIRED LIVES RESERVE Plan. The "Tax Equity and Fiscal Responsibility Act" of 1982 (TEFRA) is an evil wind, but even an evil wind often blows some good.

For additional information on the new RETIRED LIVES RESERVE Plan sponsored by the Minnesota Medical Association contact:

Harold W. Brunn, Executive Vice President
Minnesota Medical Association
2221 University Avenue S.E. #400
Minneapolis, Minnesota 55414

Phone: (612) 378-1875

*President, Professional Corporations Ltd., Washington, D.C.

Minnesota Medical Association

CME in Minnesota

Provided through the Medical Education Subcommittee on CME Resources

For assistance with scheduling meetings, please contact the MMA office (address and phone given below) for information on future medical meetings and CME courses at the state and national level.

Information for each entry is arranged as follows: Date: Name of program; Primary sponsor; Location; Contact person.

May, 1983

4 Annual Willmar Medical Center Spring Symposium; Willmar Medical Center, Willmar, MN; CONTACT: Robert M. Kaiser, M.D., 101 Willmar Avenue, Willmar, MN 56201; 612/231-5000.

6-7 Wellness and Sports Medicine; St. Louis Park Medical Center Research Foundation; Radisson South, Edina, MN; CONTACT: Elaine Anderson, Assistant Director of Medical Education, 5000 West 39th Street, Minneapolis, MN 55416; 612/927-3703.

7 Annual Hospital-Wide Research Conference; St. Paul-Ramsey Medical Center; Sheraton Midway, St. Paul; CONTACT: Ruth McIntyre, St. Paul-Ramsey Medical Center, 640 Jackson Street, St. Paul, MN 55101; 612/221-3992.

12 Medicine; St. Joseph's Hospital; St. Joseph's Hospital; CONTACT: M. A. Muesing, M.D., 303 Kingwood, Brainerd, MN 56401, 218/829-3568.

12-21 Advanced Cardiac Life Support Course; Methodist Hospital; Methodist Hospital; CONTACT: Joan Peterson, R.N., Methodist Hospital, 6500 Excelsior Blvd., P.O. Box 650, Mpls., MN 55440, 612/932-5419.

13 Quarterly Clinical Meeting; Minnesota Dermatological Society, Minneapolis; CONTACT: J. Corwin Vance, M.D., Dept. of Dermatology, HCMC, 701 Park Ave. S., Minneapolis, MN 55415.

13 American Heart Association — MN Affiliate, Annual Meeting and Scientific Sessions; American Heart Association, MN Affiliation; Kahler Hotel, Rochester, MN; CONTACT: Michael Osborn, M.D., Mayo Clinic, Rochester, MN 55901; 507/282-2511.

13-14 Ophthalmic Reviews; Mayo Clinic; Rochester; CONTACT: Mayo Clinic, 200 1st St. SW, Rochester, MN 55905, 507/284-2085.

13-15 State-of-the-Art in Clinical Anesthesiology; Rochester; CONTACT: David E. Byer, M.D., 200 1st St. SW, Rochester, MN 55905, 507/286-8701.

16-17 Topics and Advances in Pediatrics; U of M Medical School; Location undetermined; CONTACT: CME, U of M, Box 293, Mayo Memorial Bldg., 420 Delaware St. SE, Minneapolis, MN 55455, 612/373-8012.

18-20 Bone and Soft Tissue Tumor Course; Mayo Clinic; Rochester; CONTACT: Mayo Clinic, 200 1st St. SW, Rochester, MN 55905, 507/284-2085.

19-20 1983 Scientific Program; Minnesota Medical Association; Minneapolis; CONTACT: Eugenia C. Kassir, Minnesota Medical Association, 2221 University Ave. SE, Suite 400, Minneapolis, MN 55414, 612/378-1875.

23-24 Basic Life Support Course; Methodist Hospital, Methodist Hospital; CONTACT: Janell Hagen, Methodist Hospital, 6500 Excelsior Blvd., P.O. Box 650, Mpls., MN 55440, 612/932-5189.

23-24 Congenital Heart Disease; U of M; Mpls.; CONTACT: CME, U of M, Box 293 Mayo Memorial Bldg., 420 Delaware St. SE, Mpls., MN 55455, 612/373-8012.

25-27 Real Time Ultrasound in Ob-Gyn; U of M; Mpls.; CONTACT: CME, U of M, Box 293 Mayo Memorial Bldg., 420 Delaware St. S.E., Minneapolis, MN 55455, 612/373-8012.

25-27 Current Concepts in Radiation Therapy; U of M; Minneapolis; CONTACT: CME, U of M, Box 293 Mayo Memorial Bldg., 420 Delaware St. S.E., Minneapolis, MN, 55455, 612/373-8012.

29-June 11 Dutch Waterways Adventure; North Central Medical Conference; CME included; CONTACT: Betty Schmid, North Central Medical Conference, 2221 Univ. Ave. S.E., Suite 400, Minneapolis, MN 55414, 612/378-1875.

June, 1983

3-5 Annual Meeting; Minnesota Thoracic Society; Madden Lodge, Brainerd; CONTACT: Fred Rasp, M.D., 606 24th Ave. So., Suite 119, Minneapolis, MN 55454, 612/333-2156.

9-10 The Science of Marathon Running; Duluth School of Medicine; Duluth; CONTACT: Lynn Delvin, UMD School of Medicine, 2400 Oakland Ave., Duluth, MN 55812, 218/726-7581.

9-11 Interdisciplinary Approach to the Treatment of the Critically Ill Patient; St. Paul-Ramsey Medical Center; St. Paul Hotel; CONTACT: Ruth McIntyre, St. Paul-Ramsey Medical Center, 640 Jackson St., St. Paul, MN 55101, 612/221-3992.

10-11 Clinical Hypnosis; Earle Brown Center; St. Paul; CONTACT: CME, U of M, Box 293 Mayo Memorial Bldg., 420 Delaware St. SE, Mpls., MN 55455, 612/373-8012.

10-11 Annual Meeting; Minnesota Obstetrical & Gynecological Society; Barker's Island, Superior, Wisconsin; CONTACT: Mrs. Cammy Kelley or Dr. Carolyn B. Coulam, Mayo Clinic, 200 1st St. SW, Rochester, MN 55905.

14, 21, 22 Basic Life Support Instructor Program; Methodist Hospital, Methodist Hospital; CONTACT: Mary Ann Kempcke, Methodist Hospital, 6500 Excelsior Blvd., P.O. Box 650, Mpls., MN 55440, 612/932-5167.

(June continued)

15-18 G.I. Surgery; U of M Medical School; Willey Hall West Bank, U of M, Mpls.; CONTACT: CME, U of M, Box 293, Mayo Memorial Bldg., 420 Delaware St. SE, Mpls., MN 55455, 612/373-8012.

19-24 Laryngectomy Rehabilitation Seminar; Mayo Clinic, Rochester; CONTACT: Postgraduate Courses, Mayo Clinic, 200 1st St. S.W., Rochester, MN 55905; 507/284-2075.

23-25 Behavioral Pediatrics; U of M Medical School; U of M, St. Paul; CONTACT: CME, U of M, Box 293, Mayo Memorial Bldg., 420 Delaware St. SE, Mpls., MN 55455, 612/373-8012.

29-30 Human Aging VI; U of M; Mayo or Willey Hall, U of M; CONTACT: CME, U of M, Box 293 Mayo Memorial Bldg., 420 Delaware Street S.E., Mpls., MN 55455 612/373-8012.

30 Neonatal Resuscitation; North Memorial Medical Center; CONTACT: Martin Weems, M.D., 3300 Oakdale No., Robbinsdale, MN 55422; 612/520-5200

July, 1983

8-9 Women in Medicine Symposium; U of M Earle Brown Center, St. Paul; CONTACT: CME, U of M, Box 293 Mayo Memorial Bldg., 420 Delaware St. S.E., Minneapolis, MN 55455; 612/373-8012.

8-21 Orient-Express Adventure; North Central Medical Conference; CONTACT: Betty Schmid, North Central Medical Conference, 2221 University Ave. S.E., Suite 400, Minneapolis, MN 55414; 612/378-1875.

July 22-August 3 Main River Adventure, North Central Medical Conference; CONTACT: North Central Medical Conference, 2221 University Ave. S.E., Suite 400, Minneapolis, MN 55414; 612/378-1875.

July 28-30 Orthopaedic Surgery: Hip Replacement; U of M; Hyatt Regency Hotel, Nicollet Mall, Minneapolis, MN CONTACT: CME, U of M, Box 293 Mayo Memorial Bldg., 420 Delaware St. S.E., Minneapolis, MN 55455; 612/373/8012.

August, 1983

8-10 Limb Salvage & Reconstruction Application of Microvascular Techniques & Alternative Methods; Mayo Clinic; Rochester; CONTACT: Postgraduate Courses Mayo Clinic, 200 1st Street S.W., Rochester, Minnesota 55905; 507/284-2085.

22-24 Advanced Cardiac Life Support Course; North Memorial Medical Center; NMMC; CONTACT: William Nelson, 3300 Oakdale North, Robbinsdale, MN 55422; 612/520-5200.

25-26 Nursing Home Medical Directors Meeting; U of M; Mayo Memorial Auditorium; CONTACT: CME U of M, Box 293 Mayo Memorial Bldg., 420 Delaware St., S.E., Minneapolis, MN 55455; 612/373/8012.

September, 1983

1-3 Leadbetter — Endourology; U of M; 175 Willey Hall; CONTACT: U of M, Box 293, Mayo Memorial Bldg., 420 Delaware St. SE, Minneapolis, MN 55455; 612/373-8012.

9-10 Foot & Ankle Care of the Adult Patient; Mayo Clinic; Rochester; CONTACT: Postgraduate Courses, Mayo Clinic, 200 1st St. S.W., Rochester, MN 55905; 507/284-2085.

12-16 Radiology/83 Special Imaging; U of M; West Bank Auditorium, Willey Hall; CONTACT CME U of M, Box 293, Mayo Memorial Bldg., 420 Delaware Street S.E., Minneapolis, MN 55455; 612/373-8012.

16-17 Annual Meeting, Minnesota Orthopedic Society; Minneapolis; CONTACT: Jack M. Bert, M.D., 307 Gallery Medical Bldg., 17 W. Exchange St., St. Paul, MN 55102.

19-21 Pulmonary Disease — 1983; Mayo Clinic; Rochester; CONTACT: Postgraduate Courses, Mayo Clinic, 200 1st St. S.W., Rochester, MN 55905; 507/284-2085.

20 Annual Meeting, MN Physiatrie Society; Edgewood Restaurant, Cannon Falls; CONTACT: Donald J. Erickson, M.D. Emeritus, Mayo Clinic, Rochester, MN 55901.

22-23 Sixth Annual Trauma Seminar; U of M; Hennepin County Medical Center; CONTACT: CME, U of M, Box 293 Mayo Memorial Bldg., 420 Delaware St. S.E., Minneapolis, MN 55455; 612/373-8012.

23-24 Advanced Trauma Life Support Course; American College of Surgeons State Committee on Trauma, UMD, and St. Luke's Hospital, Duluth, MN; CONTACT: Charles L. Barbee, M.D. ATLS Physician Course Director, 1000 First St., Duluth, MN 55805; 218/727-7259.

28-30 Obstetrics & Gynecology; U of M; Holiday Inn, Nicollet Mall, Minneapolis; CONTACT: CME, U of M Box 293 Mayo Memorial Bldg., 420 Delaware Street S.E., Mpls. MN 55455; 612/373-8012.

30 Northwestern Pediatric Society Annual Meeting; Chanhassen; CONTACT: Frederic Kleinberg, M.D., Mayo Clinic Rochester, MN 55905; 507/284-2922

September 30-October 1 Vascular Disease; Methodist Hospital and St. Louis Park Medical Center Research Foundation; Radisson South; CONTACT: Elaine Anderson, Assistant Director of Medical Education, 5000 W. 39th Street, Minneapolis, MN 55416; 612/927-3793

October, 1983

5-7 Internal Medicine Review (10th Annual Course); U of M, Mayo Memorial Auditorium CONTACT: CME, U of M, Box 293 Mayo Memorial Building, 420 Delaware Street, S.E., Minneapolis, MN 55455; 612/373-8012

8 Current Trend in Ophthalmology — 7th Annual; Mount Sinai Hospital, Minneapolis; CONTACT: Evelyn Peterson, Medical Staff Office, Mount Sinai Hospital, 2215 Park Avenue, Minneapolis, MN 55404; 612/871-3700 ext. 1117.

For further information on *future* CME programs, contact Department of Education & Specialty Affairs, Minnesota Medical Association, 2221 University Ave. SE, Suite 400, Minneapolis, MN 55414, 612/378-1875.

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INTERNIST-CARDIOLOGIST, INTERNIST-NEPHROLOGIST specialty positions available with Mankato Clinic, Ltd. Our 30 man multi-specialty group attracts specialty referrals from a southern Minnesota area of 200,000 population. Excellent group practice opportunity in All-American community with full hospital services; full range of group fringe benefits; liberal time off; salary first year; incentive pay thereafter. For more information call collect R. F. Roskens, Administrator, or Dr. B. C. McGregory, 507-625-1811.

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OPENINGS NOW AVAILABLE in Family Practice, OB-GYN, and Orthopedics. The Albert Lea Medical & Surgical Center, Ltd. is actively recruiting for the above positions to be filled hopefully by July-August 1983. We are an eighteen man multi specialty group with excellent benefits. Full participation after the first year. No accounts receivable buy in; incentive income plan; full and complete medical and life insurance coverage; excellent pension profit sharing program. We are recruiting family practitioners for near by satellite clinics. All moving costs assumed by the clinic. Contact G. C. Wilcox, M.D. at clinic (507) 373-1441 or at home (507) 373-6974, or the Clinic Administrator C. C. Lowery at clinic (above), or at home (507) 373-8083.

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DOCTORS NEEDED in Wisconsin and Minnesota, all specialties, all locations. For confidential information, mail your C.V. to Medicus, W62 N281 Washington Avenue, Cedarburg, Wisconsin 53012.

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(Continued from page 343)

HISTORIC LOG CABIN, 3 bedroom with guest cabin, on breathtakingly beautiful LAKE SUPERIOR. Fireplaces, 600' of lakeshore with dramatic cliffs and woods. Lutsen, Minnesota. \$400.00 weekly. 920-7537 or 333-8361 (Jim).

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STAFF PSYCHIATRIST CMHC has an excellent opportunity for a staff psychiatrist. Must be board eligible. Programs include in-patient, out-patient, education and consultation, specialized services to children, the chronically mentally ill, and the chemically dependent delivered in conjunction with a seasoned team of multi-disciplinary mental health professionals including two part-time psychiatrists. Excellent four-season recreational area. Salary and fringe benefits negotiable. Contact: Donald E. Frees, ACSW, Area Program Director, P.O. Box 646, Bemidji, MN 56601. An Equal Opportunity Employer.

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(Continued on page 346)

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(Continued from page 345)

FAMILY PRACTITIONER WANTED To locate in medical office building in Upper Midwest university community of 115,000 people. Wide range of recreational, cultural, and educational facilities. Staff privileges available in modern 205 bed hospital associated with medical school Family Practice Residency Program. Guaranteed income and financial assistance available. Will pay travel expenses for interview. Contact Steven Bagan, M.D., 100 Fourth Street South, Fargo, North Dakota, 58103. Phone: 701-293-8242.

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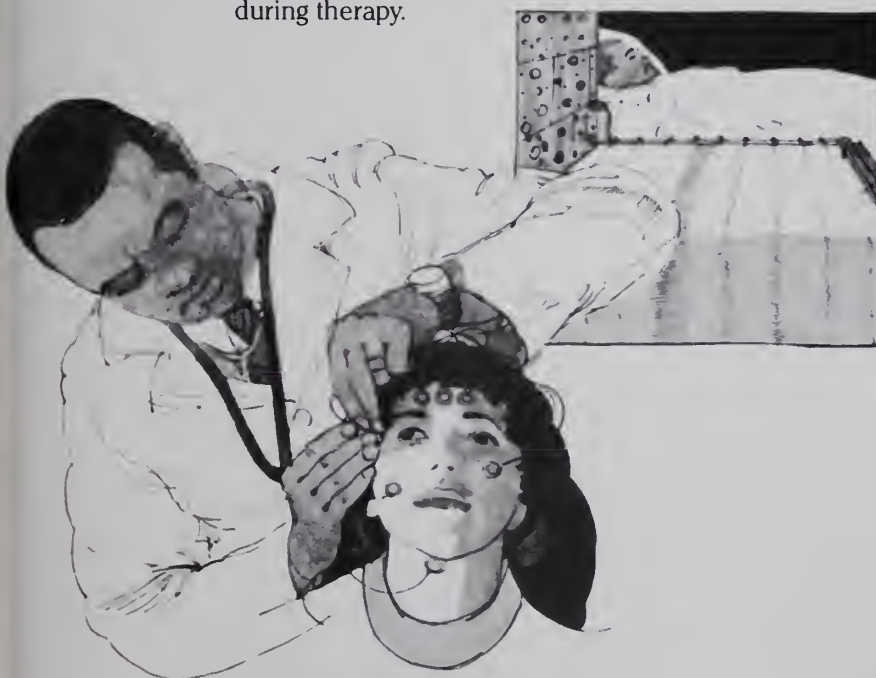
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References: 1. Kales A et al: *J Clin Pharmacol* 17:207-213, Apr 1977 and data on file, Hoffmann-La Roche Inc., Nutley, NJ. 2. Kales A: Data on file, Hoffmann-La Roche Inc., Nutley, NJ. 3. Zimmerman AM: *Curr Ther Res* 13:18-22, Jan 1971. 4. Kales A et al: *JAMA* 241:1692-1695, Apr 20, 1979. 5. Kales A, Scharf MB, Kales JD: *Science* 201:1039-1041, Sep 15, 1978. 6. Kales A et al: *Clin Pharmacol Ther* 19:576-583, May 1976. 7. Kales A, Kales JD: *Pharmacol Physicians* 4:1-6, Sep 1970. 8. Frost JD Jr, DeLucchi MR: *J Am Geriatr Soc* 27:541-546, Dec 1979. 9. Dement WC et al: *Behav Med* 5:25-31, Oct 1978. 10. Vogel GW: Data on file, Hoffmann-La Roche Inc., Nutley, NJ. 11. Karacan I, Williams RL, Smith JR: The

sleep laboratory in the investigation of sleep and sleep disturbances. Scientific exhibit at the 124th annual meeting of the American Psychiatric Association, Washington, DC, May 3-7, 1971. 12. Pollak CP, McGregor PA, Weitzman ED: The effects of flurazepam on daytime sleep after acute sleep-wake cycle reversal. Presented at the 15th annual meeting of the Association for Psychophysiological Study of Sleep, Edinburgh, Scotland, June 30-July 4, 1975. 13. Data on file, Hoffmann-La Roche Inc., Nutley, NJ.

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Adverse Reactions: Dizziness, drowsiness, lightheadedness, staggering, ataxia and falling have occurred, particularly in elderly or debilitated patients. Severe sedation, lethargy, disorientation and coma, probably indicative of drug intolerance or overdosage, have been reported. Also reported: headache, heartburn, upset stomach, nausea, vomiting, diarrhea, constipation, GI pain, nervousness, talkativeness, apprehension, irritability, weakness, palpitations, chest pains, body and joint pains and GU complaints. There have also been rare occurrences of leukopenia, granulocytopenia, sweating, flushes, difficulty in focusing, blurred vision, burning eyes, faintness, hypotension, shortness of breath, pruritus, skin rash, dry mouth, bitter taste, excessive salivation, anorexia, euphoria, depression, slurred speech, confusion, restlessness, hallucinations, and elevated SGOT, SGPT, total and direct bilirubins, and alkaline phosphatase; and paradoxical reactions, e.g., excitement, stimulation and hyperactivity.

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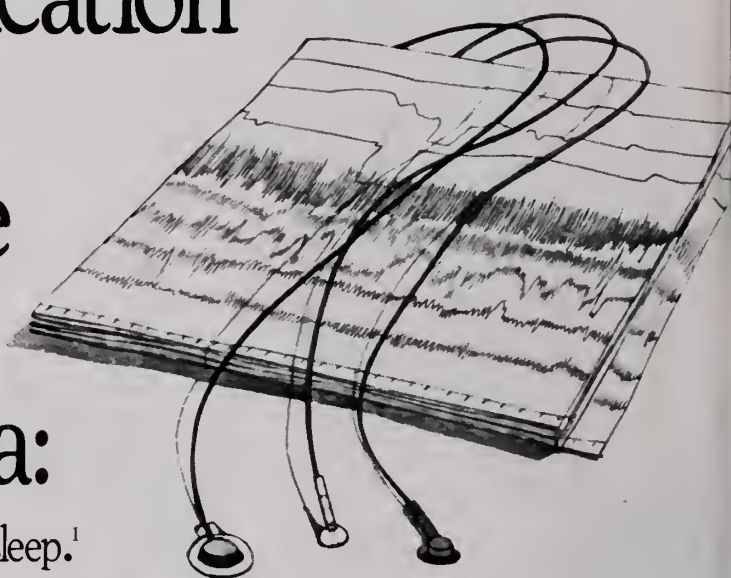
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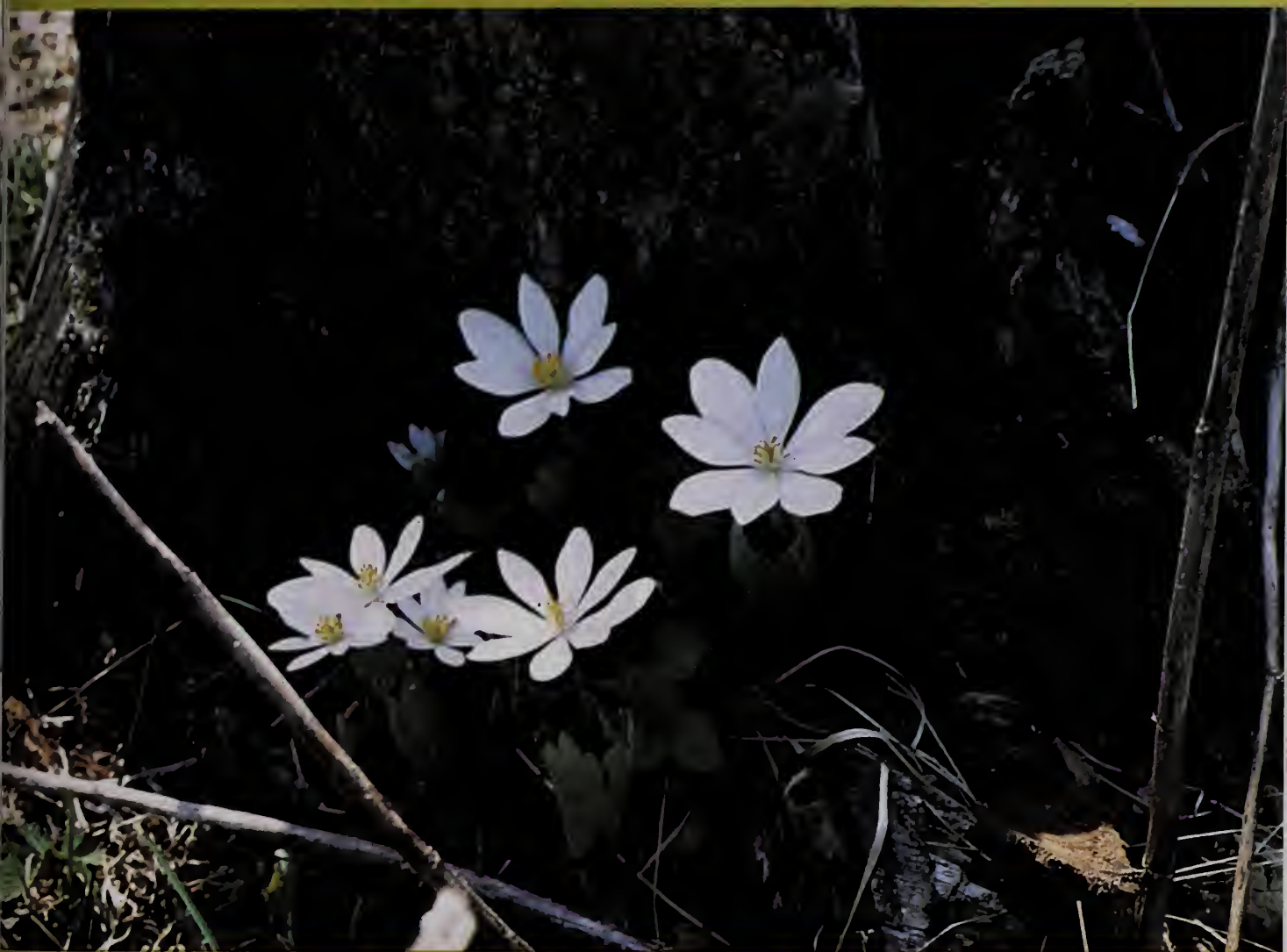
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President's Letter



The Military and Us

There are some significant similarities between the medical profession and the military profession. Both professions deal with matters that range from disruptive to catastrophic in their effect upon our lives. Both professions deal with the expenditure of huge amounts of money, which expenditures are regarded as burdensome by the body politic. Both professions deal with affairs that are difficult to assess from a cost-effective perspective. The only value of a tank is when it helps to win a battle, and who can assess the real value of a bilateral total knee replacement in an elderly lady in economic terms? No one wants war, and no one wants to be sick.

Perhaps, because of these factors both professions as organizations are regarded with negative attitudes by the media and by many segments of society. Though individual military people and individual doctors may be held in high esteem.

These similarities indicate that it may be instructive for us to study carefully a situation in which the basic attitudes and characteristics of the military profession are exposed by a highly stressful situation. Such an opportunity is afforded us in the book, "At Dawn We Slept" by Gordon W. Prang, a detailed recounting and analysis of the Japanese attack on Pearl Harbor.

There are three characteristics of the military establishment that are readily apparent from this analysis that had a profound influence on the outcome of this battle.

1. The military leaders, in part at least, did not understand their real mission. For example, while the army's true mission was to protect the Pacific fleet, the commanding general felt even in retrospect, that the army's mission was to conserve and protect its own equipment and to train new soldiers. Thus, he

kept his aircraft defueled, unarmed, and drawn into circles in the center of runways, and kept his anti-aircraft ammunition locked up miles away from the guns.

2. They had a *mind set* that the Japanese could not and would not attack Hawaii. This mind set was so strong that such an attack was not even in their differential diagnosis (to use our term), despite abundant evidence that the Japanese were planning the attack. It was so durable that even 24 hours after Pearl Harbor, the army planes in the Philippines airbases were still in a state of total unreadiness and were destroyed on the ground.

3. There was a dichotomy between the army and navy that prevented any effective cooperation. Thus, Admiral Bloch, in charge of Pearl Harbor's defense for the Navy assigned the lowest ranking officer on his staff for liaison with the army. He did not even know the army's ability to assist in long range reconnaissance, a vital activity in any concept of Island defense.

In this time of great stress for the medical profession, it is possible, I believe, to find these same three negative factors in our own ranks.

While we all recognize that as individuals our mission is to try to prevent illness and to treat it when it does occur, there are some who believe that the mission of organized medicine is to preserve the status of the profession in a position of primacy in the health care field. I suggest that our true mission is to strive to provide the best available health care for all members of society in all circumstances. In the process of fulfilling this mission our primacy will likely be best preserved.

There are some of our colleagues who have a mind

set that business-as-usual will forever prevail, that we cannot be replaced, despite abundant warnings that this is happening. I suggest that we have already been *displaced* a great deal from direct involvement in health planning and to some degree in health care delivery itself. The surest defense that we have against *being* replaced is to believe and act as though we *could* be.

We have our dichotomies. At least three come to mind:

1. We have a dichotomy between the physicians in the teaching institutions and the practicing medical community. This is illustrated by the fact that the Minnesota Medical Association membership in our teaching centers ranges from 25% down to near zero.

2. There is the dichotomy between the fee-for-service doctors and those who practice in prepaid health plans.

3. The dichotomy between the metropolitan area physicians and those in the non-metropolitan areas of our state.

In December, 1941, the army and navy discovered that they badly needed each other. They learned that with their confused concept of mission, their erroneous mind set, and their dichotomy, that despite their considerable presence and available military power they were totally incompetent and inept for the contest. I feel we run the same risk. The reason for the American disaster at Pearl Harbor was the presence of these factors, not the inherent Japanese strength.

As regards our dichotomies, I feel that we, too, need each other.

We in the practicing community need the participation in organized medicine of you teaching hospital physicians. We need your knowledge of clinical medicine to help us maintain our own standards, your understanding and sensitivity to social problems, your numbers and your economic support.

On the other hand, you need us. We, after all, are your products. Unless you relate organizationally and politically to us and observe our performance and problems as we deliver medical care in the community, how can you judge and further shape your own teaching efforts. For your trainees to continually disappear from your view beyond the gulf that now separates us must make you feel isolated. Furthermore, the time may now be here when your economic welfare is linked to ours.

We in the fee-for-service community need the participation of you Physicians in the prepaid health plans in organized medicine. You have taught us

economies in the delivery of health care. These in many cases have been painful lessons for us to learn. However, we have deep concerns about the implications of prepaid medicine and the quality of care. I believe that your presence has prevented us from all being incarcerated in the straight-jacket of regulatory medicine. This I recognize is not a view shared by everybody.

On the other hand, you need us. If there were no vigorous effective fee-for-service medical care being delivered, the same economic forces that brought your plans to existence would soon have you doing less and less for your patients for less and less income. Only if we can continue to dialogue through our professional association, in my judgment, can we understand each other's motives and problems better and be a positive influence on each other.

We in the metropolitan areas need you physicians from non-metro areas. We need your independence of mind and your idealism. You embody much of what is valid in our concept of professionalism that we are trying to defend and preserve.

On the other hand you need us. It is in the metropolitan areas that the medical profession confronts competing elements of society, such as: business, labor, political forces of various types, etc. By the very nature of things, these forces have their impact where large numbers of people live. If the medical profession is to successfully meet its challenges and preserve professionalism, this by necessity will occur in the metropolitan areas. If we are swept off the field, your own professional futures are certainly to be similarly altered.

There is no intent here to trivialize the differences of perspective that we have in these and other areas. Nor is this a plea for uniformity or conformity. I ask no one to surrender what you feel is right or to stop working for your point of view. To do so would be hopelessly unrealistic and also unproductive. Real progress is made by the synthesis of opposites. While many view compromise as a sign of weakness, I suggest that it is the path of progress.

What I would like to promote is an avoidance of dichotomies. Dichotomies are differences with chasms between opposite view points, chasms that prevent effective communication. A view across a chasm never allows for a realistic appraisal and understanding of the ground on which the other person stands.

I suggest that as we discuss and contend regarding our various problems, that we remember that the persons with whom we differ have intellectual capacity,

PRESIDENT'S LETTER

ethical standards and good will equivalent to our own. Our differences are in our perspectives. We should even allow for the fact that on rare occasions they might be right in what they say!!

I hope that we can so conduct ourselves and our affairs this year and in the coming years to deprive some enterprising writer of the opportunity to write a

book about us. A book that might be entitled, "In the Evening of Their Profession — They Slept".



Donald C. Bell, M.D.
President
Minnesota Medical Association

Cover Photograph Bloodroot

Bloodroot (*Sanguinaria canadensis*) is an early spring wild flower of the moist rich woodland areas. The pristine white flower develops and rises from the center of its curled leaf, opening in full sun, and closing at night. The red juice from the underground stem was used by Indians for dye and war paint. Bloodroot was also highly regarded by the Indians for medicinal properties.

Dr. Bradley D. Westra, a family physician in Spring Valley, took the cover photograph while on a nature hike in Lake Louise State Park. He used an Olympus OM-10 camera, 50 mm. lens with close-up attachment, and Kodachrome 64 film.

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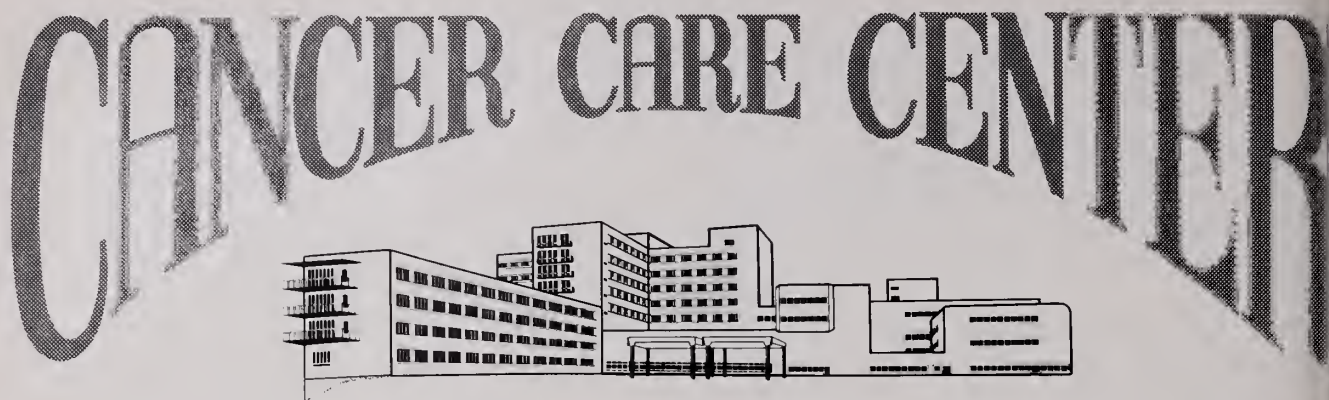
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Takayasu's Arteritis and Atypical Coarctation — The Same Disease

ARLEN R. HOLTER, M.D.* and JOHN E. BASSETT, M.D.†

Takayasu's arteritis and atypical coarctation of the descending thoracic aorta have clinical and pathological similarities. An illustrative case is presented in this report.

MAUDE ABBOTT'S¹ CLASSICAL review of the pathology coarctation of the aorta reported a 2% incidence of coarctation beyond the first segment of descending aorta. Since then over 150 cases of descending thoracic and abdominal coarctations have been reported in the Western literature. At the same time several hundred cases of Takayasu's arteritis (pulseless disease) have appeared in Japanese and Oriental journals. Only recently has the concept developed that Takayasu's arteritis and so called atypical coarctation are really manifestations of the same disease process.²

The following case report of an obstructive narrowing of the descending thoracic aorta, presents its clinical presentation, surgical management and similarity to other reports in the literature.

Case Report

A 34-year-old Chicano woman, a day care center worker, was referred for evaluation of increasing fatigue and a heart murmur. For the past six months she had experienced increasing tiredness and headaches. Her blood pressure had been elevated in the past but she had never taken any medications. Although she denied claudication she complained that her legs tired easily and had always been cool.

She had spent her childhood in Mexico and described herself as generally in poor health. She had suffered an illness at age 13 with a transient right sided paralysis. At age 16 she underwent cardiac catheterization at a Los Angeles area hospital. She was told that she had coarctation of the aorta and surgery was recommended. However, she declined because of inadequate medical insurance.

Physical examination upon admission to St. Mary's Hospital, Minneapolis, Minnesota in April 1982, revealed a middle aged woman with a blood pressure of 140/90 in both arms. There was a harsh III/VI systolic murmur heard best along the left sternal border with radiation to both carotids and laterally to both scapulae. The femoral pulses were diminished and delayed and the legs were cool with absent popliteal and pedal pulses. Electrocardiogram was normal. Chest x-ray (Figure 1) failed to demonstrate either cardiomegaly or indentation of the descending thoracic aorta.

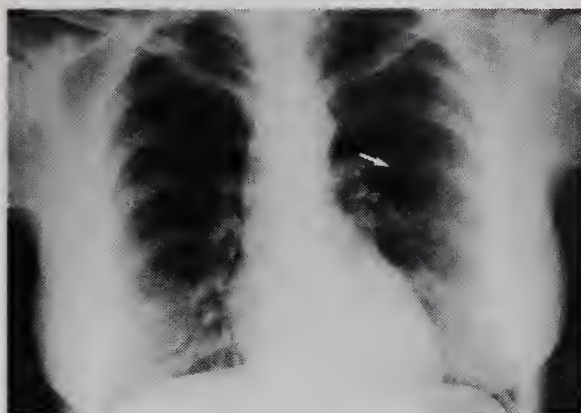


Fig. 1 — AP chest x-ray demonstrating rib notching (see arrow).

Minimal bilateral rib notching was present.

Cardiac catheterization documented a pressure of 132/100 in the ascending aorta. The pressure fell to 60/30 just distal to the left subclavian artery and remained low throughout the thoracic aorta. Angiography outlined a hypoplastic descending aorta with an area of coarctation at approximately the T-10 level (Figure 2). Enlarged intercostal arteries and other collateral vessels were present. The upper abdominal aorta had a normal caliber.

At surgery the descending aorta was found to be covered with markedly thickened pleura. This segment of aorta was narrow and hypoplastic. It was bypassed with a 12 mm. knitted prosthesis from below the left subclavian artery to just above the diaphragm (Figure 3). The graft was fashioned in an end to side fashion. No intercostal vessels were interrupted.

Postoperatively her blood pressure fell to 115/75 and pedal pulses became palpable. She had an uneventful convalescence and was discharged on the tenth postoperative day.

Discussion

Coarctation of the descending thoracic aorta was first noted at autopsy in 1835.³ However it was not until 1951 when Beattie⁴ successfully resected and grafted the stenotic segment of distal thoracic aorta with a homograft that definitive surgical treatment of this rare lesion was reported. Prior to that direct approach, dorsal sympathectomy had been performed

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Fig. 2 — Thoracic arteriogram demonstrating hypoplastic descending aorta with discrete narrowing at T-10 (see arrow).

in hopes of relieving the central hypertension.⁵ Reports of recognition and surgical treatment of coarctation at other unusual sites have appeared in the literature.^{5,6,7}

Although the majority of the authors of these early reports of atypical coarctation felt that these lesions were congenital, others⁸ believed that aortitis caused the obstruction. In their early series of thoracic aortic reconstitution, Cooley and DeBakey⁹ speculated that atypical coarctation was in fact a segmental aortitis with secondary atherosclerosis and obstruction. Expanding that series several years later, Morris¹⁰ postulated that atypical coarctations were pathologically distinct from coarctations at the aortic isthmus.

Several Japanese investigators have reported subsequently that variable involvement of Takayasu's arteritis may be indistinguishable from atypical coarctations on clinical, arteriographic, and pathologic criteria.¹¹ The clinical presentation of Takayasu's arteritis is variable. Most of the patients are female. The peak incidence is in early adulthood and the arch and arch vessels may or may not be involved. Clinically there appears to be two phases of the arteritis, an early systemic one and a later state when the arterial obstruction can produce ischemic symptoms. The case presented in this report follows this typical pattern: a childhood illness in Mexico followed by symptoms of hypertension and aortic obstruction in early adulthood.

The arteriographic pattern of Takayasu's arteritis and atypical coarctation appears to be similar.² Although initial attempts were made to classify sites of atypical coarctation these have been abandoned.

The pathology of Takayasu's arteritis consists of a marked thickening of both the intima and adventitia. Dense fibrosis may also extend into the periarterial tissues. The intimal changes often produce diaphragm

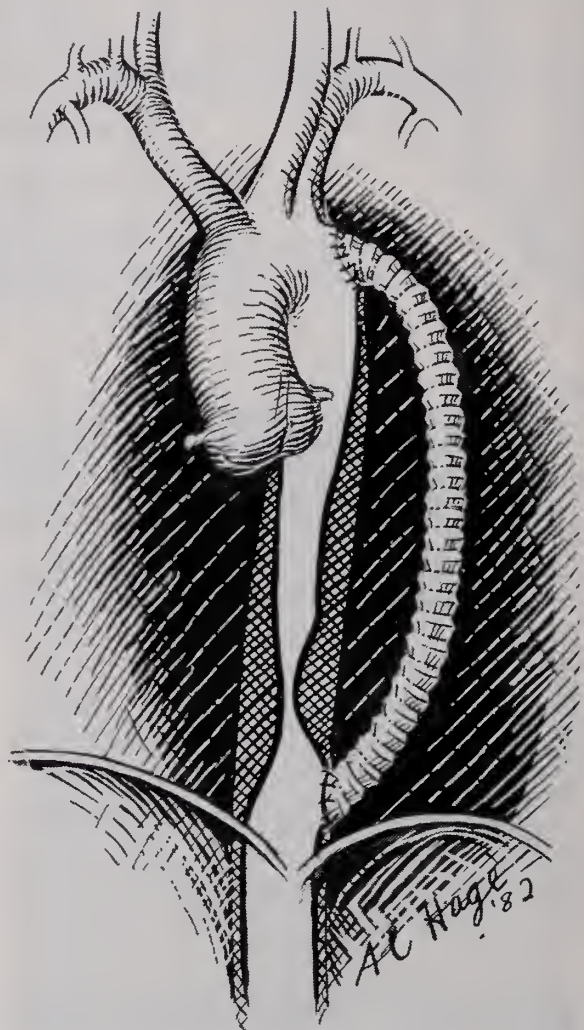


Fig. 3 — Bypass graft of narrowed segment of thoracic aorta.

like strictures similar to congenital malformations.¹⁰ Because the early surgical repairs of atypical coarctation involved resection and grafting of the narrowed segments, gross and microscopic features of these areas were obtained. These specimens also demonstrated marked adventitial fibrosis and intimal hyperplasia. However, the present method of surgical reconstruction involving bypass grafts,¹² such as employed in this case, leaves the diseased aortic segments in situ.

Congenital coarctation of the descending thoracic or abdominal aorta may occur as part of other childhood syndromes such as neurofibromatosis, rubella, or William's syndrome. However, when it occurs as an isolated lesion, the literature states that it is more likely to be a variant of Takayasu's arteritis. The clinical, arteriographic, and pathologic features

TAKAYASU'S ARTERITIS — HOLTER AND BASSETT

of this case suggest that the aortic narrowing was a sequela of a systemic illness with subsequent

inflammation, arteritis, and periaortic thickening rather than of congenital etiology.

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Continuing Medical Education University of Minnesota

Advances in Gastrointestinal Surgery — June 15-18, 1983

Wiley Hall (West Bank Auditorium), University of Minnesota

Fee: \$400

Credit: 30, Category 1 AMA

This course is designed primarily for surgeons and is presented under the direction of Doctors John S. Najarian, Professor and Chairman and John P. Delaney, Professor, Department of Surgery. The format will include lectures, moderated panel discussions, audience participation panels, and films of specific surgical procedures which will be shown during the noon hour.

National Behavioral Pediatrics Conference — June 23-25, 1983

Earle Brown Continuing Education Center, St. Paul, Minnesota

Fee: \$300

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22, PREP Course Credits

22, Prescribed hours AAFP

22, Continuing education credit by APA

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Behavioral Pediatrics is a growing discipline which emphasizes: (1) behavioral problems secondary to chronic diseases or environmental changes; and (2) behavioral problems with a physiological basis such as cyclic vomiting and attention deficit disorders. Therapeutic interventions emphasize mastery and coping. The skilled clinician is a careful observer and interested listener.

Human Aging VI: Prolonging Life/Prolonging Death — Ethical Issues — June 29-30, 1983

125 Wiley Hall, University of Minnesota, Minneapolis

Fee: \$65

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13, Prescribed AAFP

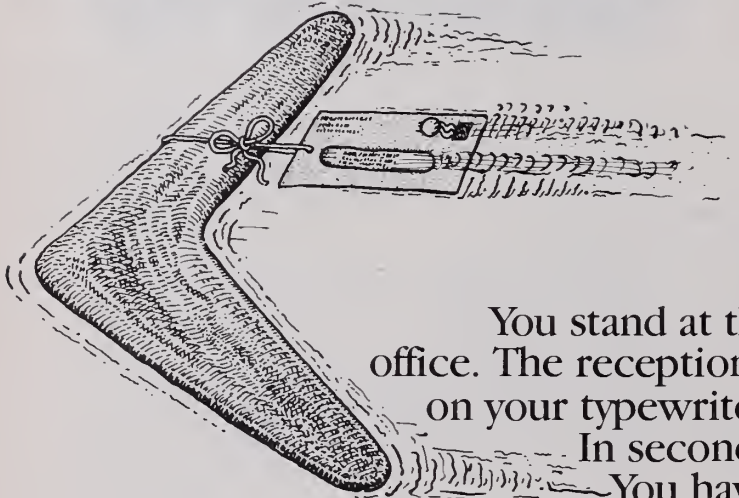
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Aspiration of Barnyard Manure

CHRIS K. GUERIN, M.D.*; RICHARD A. OWEN, M.D.† and THOMAS F. KEYS, M.D.‡

A farm boy aspirated liquid barnyard manure during a seizure. Findings, treatment, and course are described for this previously unreported phenomenon.

BARNYARD MANURE, despite its ubiquity in rural areas, seldom is the inoculum in aspiration pneumonia. Indeed, we find no case in the medical literature.

Case

A 19-year-old farm boy, gasping for breath after an epileptic attack, arrived at the emergency room of a Mayo Clinic-affiliated hospital. During a grand mal seizure, he had tumbled into a deep vat of liquid manure. Apart from idiopathic seizures for two years, his medical history was negative.

Findings at physical examination on admission were temperature, 40.0°C; blood pressure, 90/60 mm Hg; pulse, 110/minute; and respirations, 50/minute. The admitting physician noted feculent breath, manure in the patient's expectorate, a few corneal abrasions, and bilateral pulmonary rhonchi and rales.

Results of the admission blood tests were total leukocyte count, 1,400/mm³; serum creatinine, 1.7 mg/dl; hemoglobin, normal; and plasma glucose, 400 mg/dl (after intravenous administration of methylprednisolone). Sodium, potassium, calcium, bilirubin, and chloride values were normal. Phenytoin and phenobarbital levels were subtherapeutic, at 1.0 and 12.7, respectively. Arterial blood gas values while the patient breathed room air were PaO₂, 36 mm Hg; PaCO₂, 25 mm Hg; pH, 7.34; saturation, 66%; HCO₃⁻, 19; and base excess, -6. A chest roentgenogram showed pulmonary infiltrates in both upper lobes (Figure 1). Gram's stain of the sputum revealed many leukocytes and few gram-positive cocci. *Escherichia coli*, *Proteus vulgaris*, *Klebsiella pneumoniae*, yeast, and fungi grew on cultures of sputum. Results in five of five blood cultures were positive for *E. coli*. *E. coli* and mixed anaerobes grew on samples of manure collected from the farm.

Intubation was done, and mechanical ventilation was begun. The patient was given 1 g of methylprednisolone intravenously in the emergency room and two equivalent doses at six-hour intervals. Examination of the trachea and main-stem bronchi through a flexible bronchoscope showed reddened mucosa without large-airway obstruction. Intravenous administration of gentamicin, 5 mg/kg/day, penicillin G, 20 million U/day (continuous infusion), and clindamycin, 2 to 4 g/day, was begun. Three days after admission, the patient was having frequent liquid stools; chloramphenicol, 4 g/day given intravenously, was substituted for clindamycin. The patient's fever gradually subsided and was gone on the 12th hospital day. Administration of penicillin G was discontinued after seven days, but that of gentamicin and chloramphenicol was continued for 16 days. A repeat bronchoscopy 20 days after the incident showed bilateral bronchitis. For several weeks, the patient expectorated small amounts of particulate matter resembling hay. Infiltrates on

chest roentgenograms cleared within two months. The patient was urged to comply with his anticonvulsant regimen. Follow-up examination at one year showed no evidence of lung scarring or decreased pulmonary function (Figure 2).

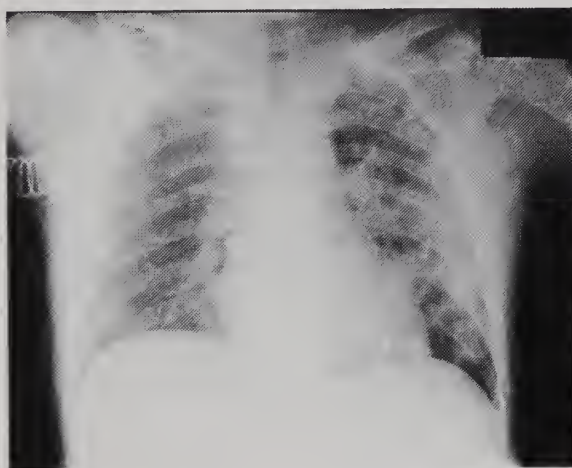


Fig. 1 — Chest roentgenogram 1 hour after aspiration of barnyard manure.

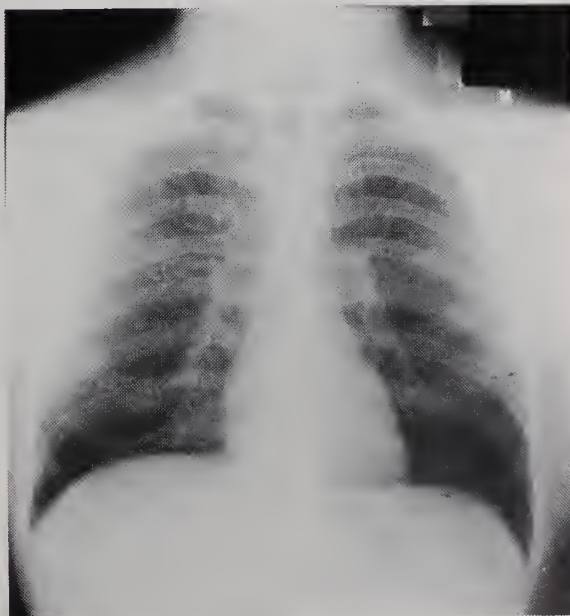


Fig. 2 — Chest roentgenogram 1 year after aspiration.

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Comment

Aspiration of oropharyngeal secretions and gastric contents has been demonstrated in normal persons.^{1,2} Since aspiration can occur without perceptible sequelae, pulmonary complications are presumably related to the frequency, volume, and character of the aspirate.³ One can classify aspiration pneumonia according to inocula. These include toxic fluids causing chemical pneumonitis, bacterial pathogens, and inert substances causing airway obstruction. The manure aspirated by our patient contained all three types of inocula.

Physical examination in cases of aspiration is similar to examinations in other pneumonias. As in many other disorders, percussion may reveal consolidation and auscultation may reveal coarse crepitations and rhonchi. Sputum may be putrid and purulent if infection due to anaerobe growth is present. Aspiration usually occurs in dependent portions of the lung. Our patient's pulmonary infiltrates corresponded to the upper lobes, the most dependent portions of the lung in the recumbent position.

Ordinarily in aspiration pneumonitis, signs of infection include leukocytosis with a shift to the left.

Our patient initially had a low total leukocyte count, as sometimes occurs in overwhelming sepsis. He had hypoxia, which is attributable to several problems: ventilation-perfusion mismatch, hemorrhage, microatelectasis, and reduced compliance.^{3,4} If less than 2.4, the pH of aspirated material is known to correlate with significant pulmonary damage. A sample of the barnyard manure obtained after the incident had a pH of 6.3.

Antibiotic treatment of aspiration pneumonitis and lung abscess suggests that elimination of the most prevalent bacterial isolate, but not necessarily all the isolates, usually is sufficient to clear the infection. In a study comparing penicillin G with clindamycin, outcomes were nearly identical despite a 15 to 20% incidence of anaerobic infections involving *Bacteroides fragilis* that were relatively resistant to penicillin.⁴ In our patient, the critical condition, the associated bacteremia, and the source of the aspirated material called for broad-spectrum antibiotic therapy.

In addition to being an unusual form of aspiration pneumonia, this case demonstrates the need for appropriate occupational restrictions in patients with seizures.

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Study on Asthma/Imagery in Children

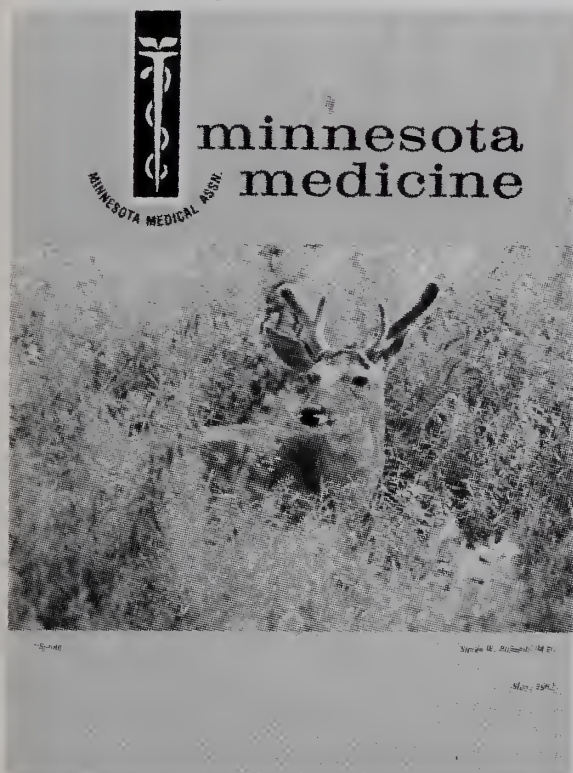
Dr. Dan Kohen is conducting a study on Asthma and Relaxation/Mental Imagery in Children. This Robert Wood Johnson Foundation-supported research project is in progress and seeking additional participants. Children in the age group 7 to 13 years with known asthma and no prior experience with relaxation/imagery (or hypnosis) are encouraged to enroll in this project. The study will compare the progress and severity of asthmatics who learn relaxation/imagery with those who do not. The study will include pulmonary function testing and personality inventories and may include (depending upon group assignment) relaxation/imagery exercises, all at no cost to the patient. Results of studies will be shared with the primary physician who will continue all pharmacologic management which will not be affected by the study protocol.

If you know of children who would benefit from and be interested in this research, please call the Project Coordinator, Janny Brust, at 874-6798 or Dr. Dan Kohen at 874-6238.

MINNESOTA MEDICINE's Best of the Year

Each Spring the Board of Editors announces its choices for the best scientific/original article and best cover for the previous year. The winners for 1983 are:

Outstanding Cover Published in 1982



"Spring" May, 1982, issue — Steven W. Richards, M.D., resident practicing at the University of Minnesota Hospitals, Minneapolis.

Outstanding Manuscript Published in 1982

Twin Cities — The Highest Incidence of Prostatic Cancer in the Nation

C. J. GODEC, M.D.,¹ H. BATES, M.D.,² R. J. FENCL, M.D.,³ and A. S. CASS, M.B.B.S.⁴

Prostatic cancer represents the leading malignant disease among the male population in the Twin Cities. Lung cancer is the leading malignancy among males in the United States. The reason for the high incidence is not known. The medical community in our area should be aware of this surprising fact and should have the necessary knowledge for early diagnosis and treatment of this disease. Basic epidemiologic data, diagnostic tests, therapeutic alternatives and the controversies involving prostatic cancer are discussed. Also, the research activity concerning prostatic cancer currently underway at our institution is briefly presented.

For 1981 it was estimated that about 60,000 new cases of prostatic cancer (C.A.P.) would be diagnosed, and the death rate for the United States would total 21,500. This high death rate would be exceeded among men only by cancer of the lung and of the colon and rectum. In the atlas of cancer mortality which provides age-adjusted mortality rates for white males by counties for the 20 year period 1950-1969 the upper midwest states of Minnesota and Iowa had an apparent excess of prostatic cancer mortality. The survey showed a range of prostatic cancer rates from a low of 37 per 100,000 males in Pittsburgh to the highest of 54 per 100,000 in Minneapolis-St. Paul.¹ The cancer of leading incidence among males in the United States is lung cancer. Nevertheless, cancer of the prostate exceeds that site in incidence in the Twin Cities area. Prostatic cancer is almost twice as frequent in the black population. The finding is even more provocative due to the fact that the black population is percentage wise smaller in the Twin Cities than is the national average (11.7% nationally vs. 2.28% locally).² Table 1 displays the rank order and incidence of most frequent cancers in the Twin Cities and nationally.³ The reason for the high incidence in the Twin Cities is not clear. Therefore, it is especially important for the physicians in our community to know the basic facts about prostatic cancer: its signs, symptoms, therapeutic possibilities, prognosis and controversies.

Epidemiology

The mortality rate for cancer of the prostate

Minneapolis-St. Paul area, 1969-1971, age-adjusted incidence rates per 100,000 population

Minneapolis-St. Paul area, 1969-1971, age-adjusted incidence rates per 100,000 population

increases markedly with age after about the fiftieth year. For prostatic cancer, a substantial but under-terminated proportion of the disease is latent and only incidentally discovered at autopsy or when surgical intervention is undertaken for other reasons.

Religion has proven to be a useful characteristic to measure in many epidemiologic studies since it is frequently a good indicator of sexual practices, fertility, dietary habits, smoking, alcohol use and circumcision. Investigation in New York City indicated that Jewish males have a slightly lower risk for the disease.^{4,5} It was postulated that circumcision might be protective. A later study, however, did not

TABLE 1

Rank Order of Cancers in Minneapolis-St. Paul SMSA Newly Diagnosed in Residents By Sex, Site and Average Annual Age-Adjusted Incidence Rates 1969-1971 (adjusted to 1970 U.S. Population)

	Males		All areas	
	Rank	Incidence	Rank	Incidence
Prostate	1	69.9	2	60.8
Lung & bronchus	2	63.6	1	72.0
Colon	3	39.9	3	32.9
Bladder	4	22.4	4	22.5
Rectum	5	20.1	5	17.5
Hodgkin's & other lymphomas	6	17.7	6	15.8
Stomach	7	16.1	7	15.1
Leukemias	8	14.3	8	12.7
Pancreas	9	12.8	9	12.6
Kidney	10	9.5	11	7.6
Larynx	11	7.6	10	8.1

¹Exclusive of Skin Cancers and Cervix in Situ Per 100,000 Population

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"Twin Cities — The Highest Incidence of Prostatic Cancer in the Nation" — October, 1982, issue — C. J. Godec, M.D., H. Bates, MD., R. J. Fencl, M.D. and A. S. Cass, M.B.B.S. Dr. Godec is from the Division of Urology, Hennepin County Medical Center, Minneapolis. Dr. Bates is in the Research Department, Metropolitan Medical Center, Minneapolis; Dr. Cass heads up the Department of Urology, at the St. Paul Ramsey Medical Center, St. Paul, Hennepin County Medical Center and Gillette Children's Hospital. Dr. Fencl, an urologist, is in private practice in Minneapolis.

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Rheumatology Corner

Radiographic Changes of the Hand in Rheumatoid and Degenerative Arthritis

JOHN BJORGEN, M.D.*

RADIOGRAPHIC CHANGES of the hand in rheumatoid and degenerative arthritis can be easily differentiated on the basis of bone density, joint space narrowing, anatomic distribution, bone reaction, and alignment.

Radiographic changes in rheumatoid arthritis are generally not helpful in the initial diagnosis, as radiographic changes tend to lag behind the clinical course. However, with the use of magnification techniques, early erosions of the metacarpal heads can be an important diagnostic clue. Radiographs of the hand also may provide the first clue of more aggressive disease, such as erosion of the carpal bones, which require institution of more potent therapy. Radiographs also provide a permanent record of bony erosion and joint space narrowing in response to treatment. This has proved helpful in trials of cyclophosphamide, where the effect of the drug in preventing structural progression was more striking than its effect on clinical parameters.

In rheumatoid arthritis, after the initial period of soft tissue swelling with increased blood flow and consequent periarticular demineralization, there is a uniform loss of cartilage from the interosseous space — especially of the metacarpal-phalangeal joints. This probably reflects the greater importance of enzymatic degradation of cartilage, rather than the direct effect of the granulomatous pannus. Patchy demineralization of the bony cortex of the distal metacarpals results in the "dot-dash" appearance and occurs at a pre-erosive stage of disease.

Later, marginal erosions occur on the radial and ulnar sides of the metacarpal heads, where they are more susceptible to synovial growth, as the bone there is not protected by a covering of articular cartilage. These erosions appear as "rat bites" as there appears to be a gnawing away of the bones, with little reactive bone formation. The ulnar styloid process is particularly prone to erosion from hypertrophied synovium.

Similar changes of symmetric joint space narrowing and erosions can be seen in the wrist, which may proceed to fusion of the carpal bones.

Department of Radiology, St. Mary's Hospital, Minneapolis.

In late stages, the joint space may be quite irregularly widened as a result of erosion of subchondral bone and disruption of the supporting capsular and ligamentous structures. The wrist shows ulnar deviation of the carpal bones, with rotational changes of the navicular and lunate bones. Frequently, a widened space is seen between the navicular and capitate bone, due to ligamentous involvement by pannus. The periarticular osteoporosis is superceded by a more uniform demineralization paralleling the generalized atrophy of muscle and soft tissue.

Osteoarthritis of the hand is easily distinguished from rheumatoid arthritis, and predominantly involves the distal interphalangeal, proximal interphalangeal, and first carpometacarpal joints of the



Fig. 1 — Moderately advanced rheumatoid arthritis showing subluxation of the metacarpal-phalangeal joints, diffuse osteoporosis, (R) rotational abnormalities and (E) erosions of the carpal bones and metacarpal heads.

wrist with asymmetric narrowing, bony sclerosis, and irregular osteophytes occurring on the edges of the joint spaces.

Joint space narrowing occurs first at the margins of the joint, where the cartilage undergoes fibrillation and erosion. This is manifest radiographically as an asymmetric narrowing. There then occurs a hypercellularity and hypervascularity in this region which, with a decrease in the normal mechanical stress on the joint, provokes dense bone formation referred to as eburnation, for its resemblance to ivory. This is associated with some osteophytic spurring, which may be related to capsular traction.

RADIOGRAPHIC CHARACTERISTICS	
OSTEOARTHRITIS	RHEUMATOID ARTHRITIS
No demineralization	Demineralization
Involvement of PIP, DIP, and 1st MCP joints	Involvement of MCP and carpal joints
Sclerotic subchondral cysts	Rat bite erosions
Asymmetric joint space narrowing	Symmetric joint space narrowing
Osteophytes	No bony reaction

There is some lateral subluxation of the involved joints, which together with the osteophytes produce the "Heberden's" node of the distal interphalangeal joint, and the "Bouchard's" node of the proximal interphalangeal joint.

Subchondral bone cysts are formed by intrusion of synovial fluid into bone, either following contusion of the bone or by the affect of chronic pressure in the

joint space. These cysts show sharp white sclerotic borders. Fragmentation of the subchondral bone may cause loose joint bodies.



Fig. 2 — Degenerative arthritis showing narrowing and sclerosis at the first metacarpal-phalangeal joint (1st MCP), Bouchard's node (B), and Heberden's node (H).

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MINNESOTA MEDICINE Covers

In order to select the best cover pictures for MINNESOTA MEDICINE the cover editor requests that all amateur photographers search slide collections and submit more pictures. The appreciation of beauty is always quite subjective, whereas the selector might find a different picture desirable for the cover. Such factors as the background, the amount of lighting, and the presence of extraneous background images on the slide may make a cover selection less desirable. It is suggested that several of your better pictures be submitted for consideration in the hopes that one might be chosen. Currently the cover editor is in need of photographs starting with next November's edition which would include late fall and winter scenes. It is requested that vertically positioned slides be submitted at this time in order to try a changed cover format.

Bruce Nydahl, M.D.
Cover Editor

Anxious patients improve in just a few days

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Indications: Management of anxiety disorders, or short-term relief of symptoms of anxiety. Anxiety or tension associated with the stress of everyday life usually does not require treatment with an anxiolytic. Symptomatic relief of acute agitation, tremor, impending or acute delirium tremens and hallucinosis due to acute alcohol withdrawal; adjunctively in: relief of skeletal muscle spasm due to reflex spasm to local pathology; spasticity caused by upper motor neuron disorders; athetosis; stiff-man syndrome. *Oral forms* may be used adjunctively in convulsive disorders, but not as sole therapy. *Injectable form* may also be used adjunctively in: status epilepticus; severe recurrent seizures; tetanus; anxiety, tension or acute stress reactions prior to endoscopic/surgical procedures; cardioversion.

The effectiveness of diazepam in long-term use, that is, more than 4 months, has not been assessed by systematic clinical studies. The physician should periodically reassess the usefulness of the drug for the individual patient.

Contraindications: Tablets or capsules in children under 6 months of age; known hypersensitivity; acute narrow angle glaucoma; may be used in patients with open angle glaucoma who are receiving appropriate therapy.

Warnings: As with most CNS-acting drugs, caution against hazardous occupations requiring complete mental alertness (e.g., operating machinery, driving). Withdrawal symptoms similar to those with barbiturates and alcohol have been observed with abrupt discontinuation, usually limited to extended use and excessive doses. Infrequently, milder withdrawal symptoms have been reported following abrupt discontinuation of benzodiazepines after continuous use, generally at higher therapeutic levels, for at least several months. After extended therapy, gradually taper dosage. Keep addiction-prone individuals (drug addicts or alcoholics) under careful surveillance because of predisposition to habituation/dependence.

Usage in Pregnancy: Use of minor tranquilizers during first trimester should almost always be avoided because their use is rarely a matter of urgency and because of increased risk of congenital malformations, as suggested in several studies. Consider possibility of pregnancy when instituting therapy; advise patients to discuss therapy if they intend to or do become pregnant.

ORAL: Advise patients against simultaneous ingestion of alcohol and other CNS depressants.

Not of value in treatment of psychotic patients; should not be employed in lieu of appropriate treatment. When using oral forms adjunctively in convulsive disorders, possibility of increase in frequency and/or severity of grand mal seizures may require increase in dosage of standard anticonvulsant medication; abrupt withdrawal in such cases may be associated with temporary increase in frequency and/or severity of seizures.

INJECTABLE: *To reduce the possibility of venous thrombosis, phlebitis, local irritation, swelling and, rarely, vascular impairment when used IV: inject slowly, taking at least one minute for each 5 mg (1 ml) given; do not use small veins, i.e., dorsum of hand or wrist; use extreme care to avoid intra-arterial administration or extravasation. Do not mix or dilute with other solutions or drugs in syringe or infusion flask. If it is not feasible to administer Injectable Valium directly IV, it may be injected slowly through the infusion tubing as close as possible to the vein insertion.*

Administer with extreme care to elderly; very ill, those with limited pulmonary reserve because of possibility of apnea and/or cardiac arrest; concomitant use of barbiturates, alcohol or other CNS depressants increases depression with increased risk of apnea; have resuscitative facilities available. When used with narcotic analgesic eliminate or reduce narcotic dosage at least 1/3, administer in small increments. Should not be administered to patients in shock, coma, acute alcoholic intoxication with depression of vital signs.

Has precipitated tonic status epilepticus in patients treated for petit mal status or petit mal variant status. Not recommended for OB use.

Efficacy/safety not established in neonates (age 30 days or less); prolonged CNS depression observed. In children, give slowly (up to 0.25 mg/kg over 3 minutes) to avoid apnea or prolonged somnolence; can be repeated after 15 to 30 minutes. If no relief after third administration, appropriate adjunctive therapy is recommended.

Precautions: If combined with other psychotropics or anticonvulsants, carefully consider individual pharmacologic effects—particularly with known compounds which may potentiate action of diazepam, i.e., phenothiazines, narcotics, barbiturates, MAO inhibitors and antidepressants. Protective measures indicated in highly anxious patients with accompanying depression who may have suicidal tendencies. Observe usual precautions in impaired hepatic function; avoid accumulation in patients with compromised kidney function. Limit oral dosage to smallest effective amount in elderly and debilitated to preclude ataxia or over-sedation (initially 2 to 2½ mg once or twice daily, increasing gradually as needed and tolerated).

The clearance of diazepam and certain other benzodiazepines can be delayed in association with Tagamet (cimetidine) administration. The clinical significance of this is unclear.

INJECTABLE: Although promptly controlled, seizures may return; readminister if necessary; not recommended for long-term maintenance therapy. Laryngospasm/increased cough reflex are possible during peroral endoscopic procedures; use topical anesthetic, have necessary countermeasures available. Hypotension or muscular weakness possible, particularly when used with narcotics, barbiturates or alcohol. Use lower doses (2 to 5 mg) for elderly/debilitated.

Adverse Reactions: Side effects most commonly reported were drowsiness, fatigue, ataxia. Infrequently encountered were confusion, constipation, depression, diplopia, dysarthria, headache, hypotension, incontinence, jaundice, changes in libido, nausea, changes in salivation, skin rash, slurred speech, tremor, urinary retention, vertigo, blurred vision. Paradoxical reactions such as acute hyperexcited states, anxiety, hallucinations, increased muscle spasticity,

insomnia, rage, sleep disturbances and stimulation have been reported; should these occur, discontinue drug.

Because of isolated reports of neutropenia and jaundice, periodic blood counts, liver function tests advisable during long-term therapy. Minor changes in EEG patterns, usually low-voltage fast activity, observed in patients during and after diazepam therapy are of no known significance.

INJECTABLE: Venous thrombosis/phlebitis at injection site, hypoactivity, syncope, bradycardia, cardiovascular collapse, nystagmus, urticaria, hiccups, neutropenia. In peroral endoscopic procedures, coughing, depressed respiration, dyspnea, hyperventilation, laryngospasm/pain in throat or chest have been reported.

Dosage: Individualize for maximum beneficial effect.

ORAL. Adults: Anxiety disorders, relief of symptoms of anxiety—Valium (diazepam/Roche) tablets, 2 to 10 mg b.i.d. to q.i.d.; or 1 or 2 Valrelease capsules (15 to 30 mg) daily. Acute alcohol withdrawal—tablets, 10 mg t.i.d. or q.i.d. in first 24 hours, then 5 mg t.i.d. or q.i.d. as needed; or 2 capsules (30 mg) the first 24 hours, then 1 capsule (15 mg) daily as needed. Adjunctively in skeletal muscle spasm—tablets, 2 to 10 mg t.i.d. or q.i.d.; or 1 or 2 capsules (15 to 30 mg) once daily. Adjunctively in convulsive disorders—tablets, 2 to 10 mg b.i.d. to q.i.d.; or 1 or 2 capsules (15 to 30 mg) once daily.

Geriatric or debilitated patients: Tablets—2 to 2½ mg 1 or 2 times daily initially, increasing as needed and tolerated (see Precautions). Capsules—1 capsule (15 mg) daily when 5 mg oral Valium has been determined as the optimal daily dose.

Children: Tablets—1 to 2½ mg t.i.d. or q.i.d. initially, increasing as needed and tolerated (not for use in children under 6 months). Capsules—1 capsule (15 mg) daily when 5 mg oral Valium has been determined as the optimal daily dose (not for use in children under 6 months).

INJECTABLE: Usual initial dose in older children and adults is 2 to 20 mg I.M. or I.V. depending on indication and severity. Larger doses may be required in some conditions (tetanus). In acute conditions injection may be repeated within 1 hour, although interval of 3 to 4 hours is usually satisfactory. Lower doses (usually 2 to 5 mg) with slow dosage increase for elderly or debilitated patients and when sedative drugs are added. (See Warnings and Adverse Reactions.) For dosages in infants and children see below; have resuscitative facilities available.

I.M. use: by deep injection into the muscle.

I.V. use: inject slowly, take at least one minute for each 5 mg (1 ml) given. Do not use small veins, i.e., dorsum of hand or wrist. Use extreme care to avoid intra-arterial administration or extravasation. Do not mix or dilute Valium with other solutions or drugs in syringe or infusion flask. If it is not feasible to administer Valium directly I.V., it may be injected slowly through the infusion tubing as close as possible to the vein insertion.

Moderate anxiety disorders and symptoms of anxiety, 2 to 5 mg I.M. or I.V., and severe anxiety disorders and symptoms of anxiety, 5 to 10 mg I.M. or I.V., repeat in 3 to 4 hours if necessary; acute alcohol withdrawal, 10 mg I.M. or I.V. initially, then 5 to 10 mg in 3 to 4 hours if necessary. Muscle spasm, in adults, 5 to 10 mg I.M. or I.V. initially, then 5 to 10 mg in 3 to 4 hours if necessary (tetanus may require larger doses); in children administer I.V. slowly; for tetanus in infants over 30 days of age, 1 to 2 mg I.M. or I.V., repeat every 3 to 4 hours if necessary; in children 5 years or older, 5 to 10 mg repeated every 3 to 4 hours as needed. Respiratory assistance should be available.

Status epilepticus, severe recurrent convulsive seizures (I.V. route preferred), 5 to 10 mg adult dose administered slowly, repeat at 10- to 15-minute intervals up to 30 mg maximum. Repeat in 2 to 4 hours if necessary, keeping in mind possibility of residual active metabolites. Use caution in presence of chronic lung disease or unstable cardiovascular status. Infants (over 30 days) and children (under 5 years), 0.2 to 0.5 mg slowly every 2 to 5 min., up to 5 mg (I.V. preferred). Children 5 years plus, 1 mg every 2 to 5 min., up to 10 mg (slow I.V. preferred); repeat in 2 to 4 hours if needed. EEG monitoring may be helpful.

In endoscopic procedures, titrate IV dosage to desired sedative response, generally 10 mg or less but up to 20 mg (if narcotics are omitted) immediately prior to procedure; if I.V. cannot be used, 5 to 10 mg I.M. approximately 30 minutes prior to procedure. As preoperative medication, 10 mg I.M.; in cardioversion, 5 to 15 mg I.V. within 5 to 10 minutes prior to procedure. Once acute symptomatology has been properly controlled with injectable form, patient may be placed on oral form if further treatment is required.

Management of Overdosage: Manifestations include somnolence, confusion, coma, diminished reflexes. Monitor respiration, pulse, blood pressure; employ general supportive measures, IV fluids, adequate airway. Use levaterenol or metaraminol for hypotension. Dialysis is of limited value.

How Supplied:

ORAL: Valium scored tablets—2 mg, white; 5 mg, yellow; 10 mg, blue—bottles of 100 and 500; Prescription Paks of 50, available in trays of 10; Tel-E-Dose® packages of 100, available in trays of 4 reverse-numbered boxes of 25 and in boxes containing 10 strips of 10.

Valrelease (diazepam/Roche) slow-release capsules—15 mg (yellow and blue), bottles of 100; Prescription Paks of 30.

INJECTABLE: Ampuls, 2 ml, boxes of 10; Vials, 10 ml, boxes of 1; Tel-E-Ject® (disposable syringes), 2 ml, boxes of 10. Each ml contains 5 mg diazepam, compounded with 40% propylene glycol, 10% ethyl alcohol, 5% sodium benzoate and benzoic acid as buffers, and 1.5% benzyl alcohol as preservative.



Medical Group Practice in Minnesota

JOHN E. KRALEWSKI, Ph.D.* and DEBORAH SHATIN, Ph.D.†

A survey conducted during this past year indicates that group practice is now the dominant form of medical practice in the state of Minnesota. These practices are increasing in size and scope of services and the administrative structures are becoming more formalized as the organizations grow. These trends suggest the continued importance of group practices for health care delivery and policy formulation.

MEDICAL GROUP PRACTICES are playing increasingly important roles in the provision of health services. More and more physicians are choosing this form of practice and the resultant groups are becoming larger and increasingly complex. This report describes the distribution of medical group practices in Minnesota along a number of salient dimensions.

The findings of the study are based on information collected in 1979 through a mailed survey, augmented with data available from secondary sources. The study identified a total of 322 medical groups of three or more physicians.‡. Full- or part-time physicians associated with these groups numbered 3,659, or 58.4 percent of all physicians reported practicing in the state of Minnesota by the State Licensing Board.

Location

Hennepin County, with 151 groups (47%), ranks

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‡Groups were identified from several resource documents dealing with the structure of medical practice in Minnesota. Eighty percent of the groups (258 of 322 groups) responded to the survey. The first two sections of this report (location and size/scope) are based on data obtained from these respondents, plus secondary data on 41 of the remaining groups. The remainder of the report concerns only those medical groups that responded to the mailed survey.

first in the number of group practices; Ramsey County, with 64 groups (20%), ranks second; and St. Louis County ranks third with 19 groups (6%). Overall, medical groups were identified in 57 (66%) of Minnesota's 87 counties.

Size of Groups and Scope of Practice

To facilitate comparison of empirical data on Minnesota medical groups with national surveys conducted by the American Medical Association, organizational size in this study was determined by a composite measure of the total number of full- and part-time physicians. The distribution of the total number of groups by size and scope of service is shown in the following table:

While the majority of the groups are relatively small (five or fewer physicians), 14 practices were identified as having 26 or more physicians. The size of the groups vary according to the type and age of the practice. Multispecialty practices tend to be larger with more than one-half comprised of 11 or more physicians, while family and single specialty groups are smaller in size. Most of the small groups are less than fifteen

TABLE 1
Distribution of Group Practices in Minnesota
by Size and Scope of Practice*

Group Size	General/ Family Practice	Multi- specialty	Single Specialty †	Number of Groups	Percentage of Group Practices
3	22	3	42	67	22.4
4	13	2	56	71	23.7
5	14	4	19	37	12.4
6-10	18	15	36	69	23.1
11-15	2	16	5	23	7.7
16-25	2	12	4	18	6.0
26 +	1	11	2	14	4.7
	72	63	164	299	100.0
	(24.1%)	(21.1%)	(54.8%)	(100.0)	

*Groups with scope of practice "other" or "unknown" were excluded from Table 1.

†The distribution of single specialty groups (other than general/family practice) is as follows: 34 percent surgical, 25 percent internal medicine or subspecialty of internal medicine, 11 percent obstetrics/gynecology, 7 percent anesthesiology, 6 percent pediatrics, and 17 percent other.

years old, indicating that these practices tend to grow in size over time. Since much of the growth in the number of group practices in Minnesota during recent years has resulted from the development of family practice and single specialty groups, they tend to be smaller practices. Nearly 40 percent of the single specialty and family practice groups were established since 1964; further, nearly 80 percent of those family practices were established since 1971. Conversely, over 50 percent of the existing multispecialty groups were established before 1951.

At the time of the study one-half (54.8%) of the groups were single specialty (other than family practice) and 21 percent were multispecialty practices. One-quarter (24%) engaged exclusively in family practice and almost all of the 63 multispecialty groups included family practice. Ninety-one percent of the single specialty groups other than general/family practice are in the seven-county metropolitan area. This likely reflects the need for a relatively large population base to sustain these highly specialized practices.

Eighty percent of the groups have only full-time physicians. Most of the groups that do have part-time physicians have but one or two such practitioners. Only ten groups hired five or more part-time physicians.

Fee-for-Service Versus Prepaid Services

Fee-for-service practice remains the predominate form of payment for physician services in Minnesota. Over 80 percent of the groups derive 90 percent or more of their practice from fee-for-service patients; however, two-thirds of the groups participate in an HMO or similar prepaid health care program. Table 2 indicates the percentage of physicians' patients covered by an HMO or similar prepaid programs.

By contrast, in 1975 only 8.4 percent of all United States group practices and 10.6 percent of Minnesota groups participated in some prepayment program.

TABLE 2

Percentage of Patients, Number and Percentage of Groups Covered by Some Form of HMO or Prepaid Programs

N = 245*			
Percentage Prepayment	Number of Groups	Percentage of Groups	Cumulative Percentage
0	81	33.1	33.1
1-5	82	33.4	66.5
6-10	43	17.6	84.1
11-20	29	11.8	95.9
Over 20	10	4.1	100.0

*Thirteen of the respondents did not answer this question.

Income Distribution

Physicians are compensated under several methods of income distribution. Once physicians become full members of their groups, a prearranged salary plus an incentive based on billings is the most common method of distributing income; incentive only is the least common (Table 3). Equal share distributions are relatively common in single specialty groups and uncommon in multi-specialty groups, while the reverse order holds for incentive only distribution plans.

Incentive only plans are most often found in small multispecialty groups (ten or fewer physicians); the equal share method of income distribution, in contrast, is characteristic of *single specialty* groups that have ten or fewer physicians.

Prepayment does not appear to influence income distribution systems. Over 40 percent of the groups with 11 percent or more of their income derived from some form of HMO compensate their physicians on a salary plus incentive (billing) basis, even though this method is believed to have an adverse effect on cost containment (i.e., encourage over-utilization of services).

Services Provided by Group

The percentage of the responding groups having

TABLE 3

Form of Reimbursement by Scope of Group Practice (in %)*

Scope	Prearranged Salary	Incentive Only	Salary Plus	Equal Share	Other
General/Family Practice	10.0 (6)	15.0 (9)	38.3 (23)	15.0 (9)	21.7 (13)
Single Specialty	15.9 (20)	6.3 (8)	38.1 (48)	27.8 (35)	11.9 (15)
Multi-specialty	14.5 (8)	21.8 (12)	40.0 (22)	5.5 (3)	18.2 (10)
Total	14.1 (34)	12.0 (29)	38.6 (93)	19.5 (47)	15.8 (38)

*Seventeen of the respondent did not answer this question.

various services that are owned and operated is as follows:

Diagnostic Xray	60%
Clinical laboratory	58%
Audiology facility	23%
Electronic data processing services	14%
Physical therapy services	9%
Social services	5%
Optical dispensary (group owned and operated)	3%, leased out 2%
Multiphasic screening	4%
Pharmacy (group owned and operated)	3%, leased out 5%
Therapeutic Xray	2%
Dental	1%

Generally, the older and larger multispecialty groups provide a broader range of owned and operated services. Of the four most prevalent services, audiology and electronic data processing (EDP) are more frequently found in the larger group practices, while diagnostic Xray and clinical laboratory services are more evenly distributed across all sizes of practices. Interestingly enough, family practice groups clearly mirror multispecialty practices in terms of ownership and operation of the four most prevalent services, even though they tend to be smaller in size and less mature organizationally (Table 4). Single specialty groups lacking diagnostic x-ray services are primarily engaged in anesthesiology and surgery, while those that do not own or operate laboratories are primarily surgical groups. Almost all multispecialty groups with six or more physicians operate diagnostic x-ray services and clinical laboratory facilities.

Administrators and Medical Directors

An administrator or manager is employed full-time by 56 percent of the responding groups. Forty-seven percent of Minnesota administrators have achieved a B.A. or B.S. as their highest educational degree. Only 12 percent have an M.B.A./M.H.A. or higher degree. An average of 87 percent of the groups with six or more physicians have a full-time administrator, while only 37 percent of the groups with three, four or five physicians have an administrator on a full-time basis. Approximately 13 percent of the groups have part-time administrators. Most of these practices have five or fewer physicians.

Ninety-three percent of the multispecialty groups employ a full-time administrator probably reflecting their tendency toward larger practices and the complexity of multispecialty organizations (Table 5). Family practice groups report full-time administrators in nearly 60 percent of those organizations, while only 40 percent of single specialty groups have this level of administration. Family practitioners appear to utilize a level of administration beyond that explained by the size and complexity of their practices. This is further underscored by the fact that family practice groups report higher rates of *full-time* medical directors.

The employment of either a full-time or part-time medical director was reported by only 18 percent of the responding groups (Table 5). As expected, a higher proportion of the larger and more complex multispecialty groups reported having a formally designated medical director, but family practice groups had the

TABLE 4
Percentage of Groups That Own and Operate Facilities by Scope of Service

	<u>Diagnostic Xray</u>	<u>Clinical Lab</u>	<u>Audiology Facility</u>	<u>Data Processing</u>
General/Family Practice	78.8 (52)	83.3 (55)	34.3 (23)	14.9 (10)
Single Specialty	39.5 (51)	31.0 (40)	9.3 (12)	7.8 (10)
Multi-specialty	87.5 (49)	91.1 (51)	41.1 (23)	25.0 (14)
Total	60.6 (152)	58.2 (146)	23.0 (58)	13.5 (34)

TABLE 5
Presence of an Administrator and Medical Director by Scope of Practice (in %)

Scope of Practice	<u>Administrator</u>		<u>Medical Director</u>	
	<u>Part-time</u>	<u>Full-time</u>	<u>Part-time</u>	<u>Full-time</u>
General/Family Practice	19.4 (13)	56.7 (38)	9.1 (6)	12.1 (8)
Single Specialty	13.4 (17)	39.4 (50)	2.3 (3)	5.5 (7)
Multi-Specialty	1.8 (1)	92.7 (51)	26.8 (15)	8.9 (5)
Total	12.4 (31)	55.8 (139)	9.6 (24)	8.0 (20)

highest percent and largest number of full-time directors.

Board of Directors and Executive Committees

Three-fourths (76%) of the groups indicated that they have a board of directors, probably reflecting their tendency toward corporate and professional association forms of organization. Fifty-one percent of the boards of directors are totally composed of physicians from the groups. One-half of the boards of directors meet on a monthly basis; quarterly meetings are the next most prevalent meeting interval.

The number of groups indicating that they had an executive committee was far fewer than those with a board of directors, only 21.3 percent. Those group practices reporting executive committees tended to be large multispecialty groups (11 or more physicians). Nearly two-thirds (63%) of the executive committees are comprised of physicians from the group, and another 38 percent are made up of all the physicians in the group. Approximately two-thirds of the executive committees meet at least monthly.

Discussion

The group practice of medicine is playing a major role in the provision of health services in the state of Minnesota. Moreover, the patterns emerging in Minnesota may be indicative of a trend in the future organization of medical practices throughout the

United States. It is becoming increasingly difficult to practice modern day medicine as a solo practitioner. Changing technologies, rapidly escalating costs, and the complexity of the environment (including regulations, reimbursement programs, and competition), all serve to further the group practice concept in that groups have the organizational capacity to successfully deal with these issues.

The fact that group practices appear to be increasing in size and diversifying their services most likely results from these same environmental challenges. The expansion of the administrative component of groups is a further response to these organizational demands, as group practices become more highly organized and devote more resources to governance and administration. While this may well change the character of the groups and the relationships among the practitioners, it will also undoubtedly increase the overall influence of this form of practice in the health care field and on policies guiding the health care system. As such, group practices are clearly emerging as major power centers in the health field. The consequences of these organizational changes are not well understood, however, and practitioners and researchers need to focus a sustained research effort on this area of inquiry.

Acknowledgment

Acknowledgment is made to the Minnesota Medical Association for its cooperation in the study. The authors also wish to thank Bryan Dowd for his assistance.

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Medical Foundation Elects Officers

Dr. John B. Coleman, a St. Paul radiologist, has been elected president of the Minnesota Medical Foundation for a two-year term.

Dr. Nadine Smith was elected to serve on the executive committee of the Foundation.

OFTEN INSEPARABLE: PAIN AND ANXIETY

**A pathologic partnership
one sees every day**

Pain—triggering anxiety—
which accentuates the percep-
tion of pain...together they're
worse than either alone.
And since they're usually both

present in musculoskeletal
disorders, the best therapy is
often a combination of anal-
gesic and anxiolytic agents.
Equagesic[®]-M combines the
pain relief of aspirin with the
tension-reducing properties

of meprobamate—because
together they're better than
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tablets

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Effective analgesic/anxiolytic alliance





Prompt, effective relief from the dual burden
of pain and anxiety

Equogesic-M[®] tablets

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Effective analgesic/anxiolytic alliance

Proven superior to aspirin alone in controlled clinical trials

(BRIEF SUMMARY)

DESCRIPTION: Each tablet contains 200 mg meprobamate and 325 mg aspirin.

INDICATIONS: Adjunct in short-term treatment of pain accompanied by tension and/or anxiety in patients with musculoskeletal disease. Clinical trials demonstrated in these situations relief of pain is somewhat greater than with aspirin alone. Effectiveness in long-term use, i.e. over 4 months, has not been assessed by systematic clinical studies. Physicians should periodically reassess usefulness of drug for individual patients.

CONTRAINDICATIONS: ASPIRIN: Allergic or idiosyncratic reactions to aspirin or related compounds. MEPROBAMATE: Acute intermittent porphyria, allergic or idiosyncratic reactions to meprobamate or related compounds, e.g. carisoprodol, mebutamate, or carbromal.

WARNINGS: ASPIRIN: Use salicylates with extreme caution in patients with peptic ulcer, asthma, coagulation abnormalities, hypoprothrombinemia, vitamin K deficiency, or those on anticoagulants. In rare instances, aspirin in persons allergic to salicylates may result in life-threatening allergic episodes. MEPROBAMATE: DRUG DEPENDENCE: Physical and psychological dependence, and abuse have occurred.

Chronic intoxication from prolonged ingestion of, usually, greater than recommended doses is manifested by ataxia, slurred speech, and vertigo. Therefore, carefully supervise dose and amounts prescribed and avoid prolonged use, especially in alcoholics and others with known propensity for taking excessive quantities of drugs. Sudden withdrawal after prolonged and excessive use may precipitate recurrence of preexisting symptoms, e.g. anxiety, anorexia, or insomnia, or withdrawal reactions, e.g., vomiting, ataxia, tremors, muscle twitching, confusional states, hallucinosis, and rarely, convulsive seizures. Such seizures are more likely in persons with CNS damage or preexistent or latent convulsive disorders. Onset of withdrawal symptoms occurs usually within 12 to 48 hours after discontinuation; symptoms usually cease

within next 12-to-48-hour period. When excessive dosage has continued for weeks or months, reduce dosage gradually over 1 to 2 weeks rather than stop abruptly. Alternatively, a short-acting barbiturate may be substituted, then gradually withdrawn.

POTENTIALLY HAZARDOUS TASKS: Warn patients meprobamate may impair mental or physical abilities required for potentially hazardous tasks, e.g., driving or operating machinery.

ADDITIONAL EFFECTS: Since CNS suppressant effects of meprobamate and alcohol or meprobamate and other psychotropic drugs may be additive, exercise caution with patients taking more than one of these agents simultaneously.

USAGE IN PREGNANCY AND LACTATION: An increased risk of congenital malformations associated with minor tranquilizers (meprobamate, chloralhydrate, and diazepam) during first trimester of pregnancy, has been suggested in several studies. Because use of these drugs is rarely a matter of urgency, their use during this period should almost always be avoided. The possibility that a woman at child-bearing potential may be pregnant at time of institution of therapy should be considered. Advise patients if they become pregnant during therapy or intend to become pregnant to communicate with their physicians about desirability of discontinuing the drug.

Meprobamate passes the placental barrier. It is present both in umbilical cord blood and in breast milk at plasma levels and in breast milk at lactating mothers of concentrations two to four times that of maternal plasma. When use of meprobamate is contemplated in breastfeeding patients, consider the drug's higher concentrations in breast milk as compared to maternal plasma levels. **USAGE IN CHILDREN:** Keep preparations with aspirin out of reach of children. Equogesic-M is not recommended for patients 12 years of age and under. **PRECAUTIONS:** ASPIRIN: Salicylates an-

tagonize uricosuric activity of probenecid and sulfipyrazole. Salicylates are reported to enhance hypoglycemic effect of sulfonylurea antidiabetics. MEPROBAMATE: Use lowest effective dose, particularly in elderly and/or debilitated, to preclude over-sedation. Meprobamate is metabolized in the liver and excreted by the kidney. To avoid excess accumulation exercise caution in its use in patients with compromised liver or kidney function. Meprobamate occasionally may precipitate seizures in epileptic patients. It should be prescribed cautiously and in small quantities to patients with suicidal tendencies.

ADVERSE REACTIONS: ASPIRIN: May cause epigastric discomfort, nausea, and vomiting. Hypersensitivity reactions, including urticaria, angioneurotic edema, purpura, asthma, and anaphylaxis may rarely occur. Patients receiving large doses of salicylates may develop tinnitus.

MEPROBAMATE: CNS: Drowsiness, ataxia, dizziness, slurred speech, headache, vertigo, weakness, paresthesias, impairment of visual accommodation, euphoria, overstimulation, paradoxical excitement, fast EEG activity. GI: Nausea, vomiting, diarrhea. CARDIOVASCULAR: Palpitation, tachycardia, various forms of arrhythmia, transient ECG changes, syncope, hypotensive crisis.

ALLERGIC OR IDIOSYNCRATIC: Milder reactions are characterized by itchy, urticarial, or erythematous maculopapular rash, generalized or confined to the groin. Other reactions include leukopenia, acute nonthrombocytopenic purpura, pelecchia, ecchymoses, eosinophilia, peripheral edema, adenopathy, fever, fixed drug eruption with cross-reaction to carisoprodol, and cross-sensitivity between meprobamate/mebutamate and meprobamate/carbromal. Rare, more severe hypersensitivity reactions include hyperpyrexia, chills, angioneurotic edema, bronchospasm, aliguria, and anuria. Also, anaphylaxis, exfoliative dermatitis, stomatitis, and proctitis. Stevens-Johnson syndrome and

bullous dermatitis have occurred. **HEMATOLOGIC (SEE ALSO "ALLERGIC OR IDIOSYNCRATIC"):** Agranulocytosis, aplastic anemia have been reported, although no causal relationship has been established, and thrombocytopenic purpura. **OTHER:** Exacerbation of porphyria symptoms.

DOSEAGE AND ADMINISTRATION: Usual dose is one or two tablets, 3 to 4 times daily as needed for relief of pain when tension or anxiety is present. Not recommended for patients 12 years of age and under.

OVERDOSAGE: Treatment is essentially symptomatic and supportive. Any drug remaining in the stomach should be removed. Induction of vomiting or gastric lavage may be indicated. Activated charcoal may reduce absorption of both aspirin and meprobamate. Aspirin overdosage produces usual symptoms and signs of salicylate intoxication. Observation and treatment should include management of hyperthermia, specific parenteral electrolyte therapy for ketoacidosis and dehydration, watching for evidence of hemorrhagic manifestations due to hypoprothrombinemia which, if it occurs, usually requires whole-blood transfusions. Suicidal attempts with meprobamate have resulted in drowsiness, lethargy, stupor, ataxia, coma, shock, vasomotor and respiratory collapse.

Some suicidal attempts have been fatal. The following data, reported in the literature and from other sources, are not expected to correlate with each case (considering factors such as individual susceptibility and length of time from ingestion to treatment), but represent usual ranges reported. Acute simple overdoses (meprobamate alone): Death has been reported with ingestion of as little as 12 gram meprobamate and survival with as much as 40 gram.

BLOOD LEVELS: 0.5-2.0 mg percent represents usual blood-level range after therapeutic doses. The level may occasionally be as high as 3.0 mg percent. 3-10 mg percent usually corresponds to

findings of mild-to-moderate symptoms of overdosage, such as stupor or light coma.

10-20 mg percent usually corresponds to deeper coma, requiring more intensive treatment. Some fatalities occur. At levels greater than 20 mg percent, more fatalities than survivals can be expected.

Acute combined overdoses (meprobamate with other psychotropic drugs or alcohol): Since effects can be additive, history of ingestion of a low dose of meprobamate plus any of these compounds (or of a relatively low blood or tissue level) cannot be used as a prognostic indicator.

In cases of excessive doses, sleep ensues rapidly and blood pressure, pulse, and respiratory rates are reduced to basal levels. Any drug remaining in stomach should be removed and symptomatic treatment given. Should respiration or blood pressure become compromised, respiratory assistance, CNS stimulants, and pressor agents should be administered cautiously as indicated. Diuresis, osmotic (mannitol) diuresis, peritoneal dialysis, and hemodialysis have been used successfully in removing both aspirin and meprobamate. Alkalinization of the urine increases excretion of salicylates. Careful monitoring of urinary output is necessary, and caution should be taken to avoid overhydration. Relapse and death, after initial recovery, have been attributed to incomplete gastric emptying and delayed absorption.

HOW SUPPLIED: Bottles of 50 scored tablets.

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Breast Cancer — Duluth, Minnesota

A Community Analysis

ROBERT CAMPAIGNE, M.D.*

BREAST CANCER is the most common malignancy in American women, accounting for 27% of the total, with over 100,000 additional new cases in 1982 expected. It is estimated that one of eleven women will develop breast malignancy in her lifetime.¹

Introduction

An analysis of breast cancer was performed in Duluth, Minnesota during the years 1935 through 1974. There were 1,524 cases studied (see Table 1) in this time period. All cases of breast malignancy were extracted from the records of St. Mary's, St. Luke's and Miller-Dwan Hospitals. 82% of the cases were followed for a five-year period of time and 55% of the cases for a ten-year period of time. The crude breast cancer death rate was 17/100,000. The cases were followed through utilization of the Duluth Tumor Registry in each respective hospital. There were 644 cases of "secondary" breast cancer which were those cases referred to this city for secondary care following primary therapy in some other location. These cases were not included in this study.

TABLE 1

Cases Cancer of the Breast. 1935-1974	
St. Luke's, St. Mary's, Miller-Dwan Hospitals	
Primary Cases	1524
Secondary Cases	644
Total Cases	2168

Age of Patient

The age distribution, ranging from 20 years to 97 years, can be seen in Table 2. The youngest patient experienced an adenocarcinoma, the oldest a medullary carcinoma. The curve is a bell-shaped one with the majority of cases occurring between 50 and 70 years. The average age is 58 years. The national average according to the Connecticut Tumor Registry is 59 years. Interestingly, the age distribution approximates most similarly carcinoma of the ovary.²

Location of Cancer

Two-thirds of all the cancers in this series occurred in the lateral half of the breast with over 50% of the cases in the upper outer quadrant. One-third of the

cancers occurred in the center core and medial half of the breast mass, demonstrated on Table 3.

Types of Cancer of the Breast

The scirrroid adenocarcinoma and adenocarcinoma were the most common tumor types accounting for 86% of the cases. Inflammatory carcinoma accounted

TABLE 2

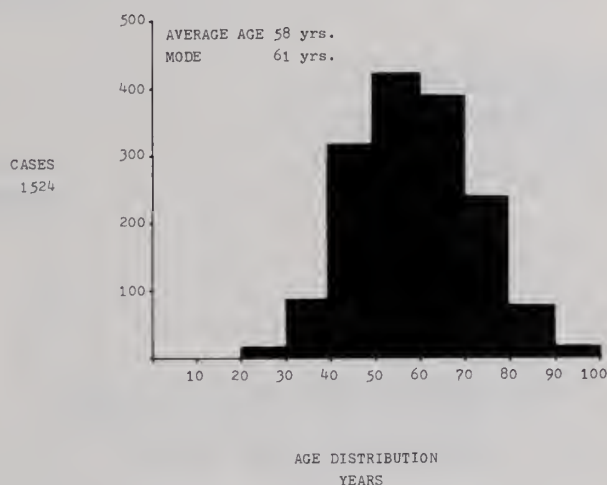
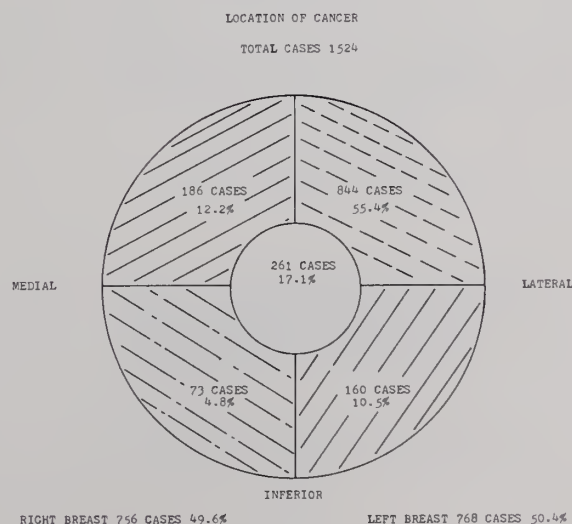
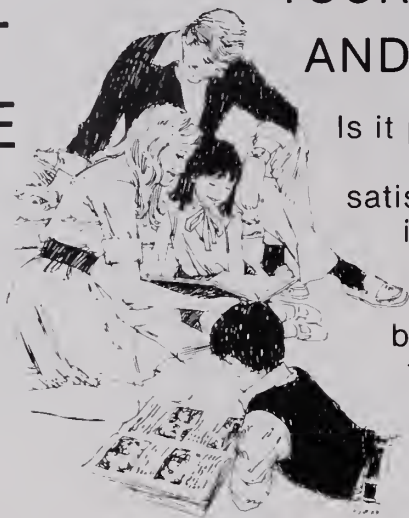


TABLE 3



*Duluth, Minnesota.

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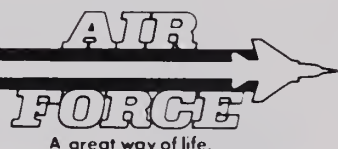


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BREAST CANCER — CAMPAIGNE

for 1% of the total with 15 cases. The mucinous carcinoma presented in two varieties, the pure mucinous one and/or the scirrhoid variety. The various types can be seen in Table 4.

TABLE 4
TYPES CANCER OF THE BREAST

	CASES	PERCENT
SCIRRHOUS ADENOCARCINOMA	702	46.1
ADENOCARCINOMA	571	37.8
INTRADUCTAL CARCINOMA	80	5.1
MEDULLARY CARCINOMA	45	2.9
COMEDO CARCINOMA	39	2.5
MUCINOUS CARCINOMA	30	1.9
LOBULAR CARCINOMA	21	1.4
INFLAMMATORY CARCINOMA	15	1.0
INTRADUCTAL PAPILLARY ADENOCARCINOMA	10	0.6
PAGETS DISEASE WITH INTRADUCTAL ADENOCARCINOMA	5	0.3
TUBULAR CARCINOMA	3	0.2
ADENOCYSTIC CARCINOMA	3	0.2
TOTAL CASES	1524	100.0%

Results

The statistics are presented in Figure 1 divided into Stages I-II-III, including all age groups. Division into specific age-stage grouping was precluded by insufficient numbers as only 645 cases could be followed for any ten-year period of time. Stage I cases were treated by surgery alone, primarily radical mastectomy and/or radical mastectomy with radiation. The latter received 3,000 to 5,000 Rads

through four portals of radiation. Stage II carcinoma was treated primarily by radical mastectomy and radiation. Only 36 cases underwent surgery without supplemental radiation, all expiring within a five-year period of time. Stage III carcinoma was also treated by radical mastectomy and radiation therapy. All cases of breast cancer were classified according to the Manchester staging mechanism as follows:

Stage I: Cancer confined to the breast.

Stage II: Cancer of the breast with positive axillary lymph nodes and no evidence of supraclavicular lymph nodes or distant metastases.

Stage III: Fixed cancerous lesions of the breast that are ulcerated or with inflammatory changes that involve more than $\frac{1}{3}$ of the breast mass.

Stage IV: Cancer of the breast with distant metastasis.

Stage I cancer of the breast was treated by radical mastectomy with or without radiation. The patients receiving the adjuvant radiation obtained a 1% to 2% additional survival rate throughout the ten-year follow-up period, but this was not statistically significant. The five and ten year survival rates were 81% and 62% respectively.

Stage II breast cancer was treated exclusively by radical mastectomy combined with X-ray therapy of which 60% of the cases survived five years and 30% survived ten years. Thirty-six cases refused further therapy, none of which survived five years postoperatively.

Stage III cancers had a survival rate of 11% for five years with no cases surviving beyond seven years.

The rate of local recurrence in either chest wall, axilla or operative site ranges from 6% in STAGE I and STAGE II cases to 12% in STAGE III cases. Over 50% of all recurrences, general or localized,

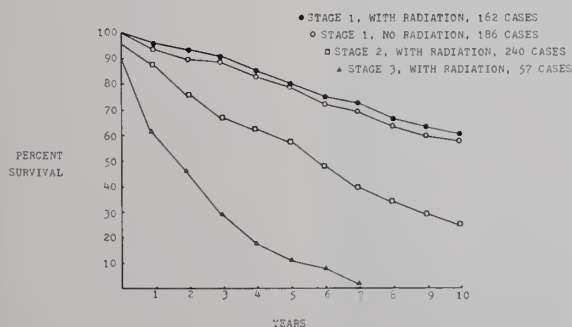


Figure 1

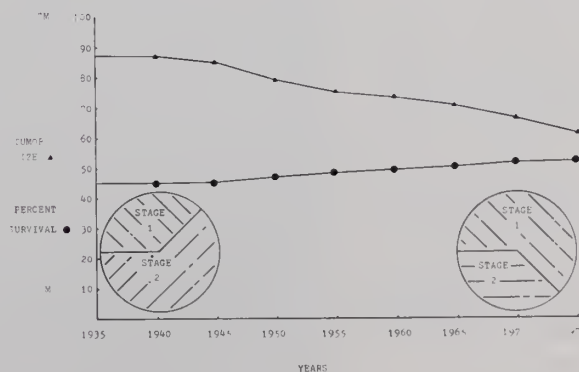


Figure 2

appeared within five years of surgery, and 82% appeared within ten years. There were 24 cases recurring in the series after ten years, the longest twenty-three years postmastectomy.

Bilateral Breast Cancer

The incidence of bilaterality was 8.0% with 47% of the cases occurring within five years of the original lesion and 90% within eight years. 15% of the total cases were synchronous in their occurrence. The critical time period for developing a second primary lesion is then, five to eight years from the onset of the original surgery, as one can see in Table 5.

A crude analysis of survival was performed for each five year time period (Figure 2) for all stages of operable breast cancer. There has been a modest but decided increase in survival rates of 5% since 1935. The survival is directly proportional to the size of the original lesion and stage of the lesion in question. Between 1935 and 1945 the average size of a breast cancer was approximately $4\frac{1}{4}$ cm., with almost two-thirds of the cases STAGE II classification, whereas by 1970 almost two-thirds of all the cases were STAGE I disease with the average size of the lesion between 2 and 3 cm.

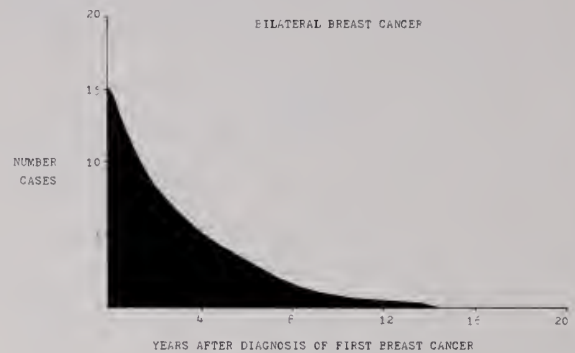
Discussion

Inadequacy of data recorded on the hospital charts and lack of a concise staging system coupled with a lack of a standard approach in the pathology reporting system, has stymied accurate attempts to evaluate treatment modalities of breast cancer.

The initial work has begun in this city utilizing the T-N-M classification. "T" representing the primary tumor, "N" representing the axillary lymph nodes and "M" the metastases, coupled with the T-N-M Survival Pathology Classification.³ This methodology is vitally important now that adjuvant chemotherapy offers a method of destruction of pre-clinical disease post-operatively, both lengthening disease-free intervals and survival. Patients records and subsequent care will be enhanced by the permanent addition of this very accurate and structured system.

Surgeons must search for the most efficient manner of removing the breast malignancy. Since 1894 the standard approach has been the radical mastectomy of Halstad. With earlier diagnosis of breast cancer, lesser procedures have become popular in Duluth since 1965. Additional reasons for advocating "lesser" surgery has been the patient revulsion at the

TABLE 5



mitigation and deformity accompanying a radical mastectomy. Performing lesser procedures does however bring forth two significant surgical hazards; the pectoral muscles remain intact except in the Patey mastectomy, where the pectoralis minor and fascia are removed. Secondly, the lesser procedures bring forth a more shallow plane of dissection in reference to the pectoralis major muscle and fascia, which is ominous in deep seated lesions. We may then compromise our surgical endeavor and subsequent survival by not removing an adequate amount of tissue. The radical mastectomy has been and is as yet the standard procedure for operable breast cancer to which all other procedures must statistically compare. In Duluth, with approximately one-half of all breast cancers treated by lesser procedures, there is an indication of both an increase in five year local and general recurrence rates although not as yet statistically significant. It becomes most imperative in selection of the patient undergoing a lesser procedure, that the cancer be as completely removed as is surgically possible.

Conclusion

The survival rate of breast cancer in Duluth compares favorably with other series.^{4,5} There is a statistically but moderate increase in survival over the forty year time period of this study. Detection of the smaller breast lesions will undoubtedly dictate a more modest surgical procedure for operable breast cancer. Until however, that panacea exists the surgeon must exert caution in utilization of any lesser surgical procedure and not be swayed by the contemporary philosophy of "minimal surgery", which has not as yet stood the test to time. Statistically, surgery is as yet the primary treatment in operable breast cancer in the early debulking of the lesion with hopefully adjuvant therapy the final modality in the cure of this devastating disease process.

References will be found on page 370.

An added complication... in the treatment of bacterial bronchitis*



Brief Summary: Consult the package literature for prescribing information.

Indications and Usage: Cefclor® (cefclor, Lilly) is indicated in the treatment of the following infections when caused by susceptible strains of the designated microorganisms:

Lower respiratory infections, including pneumonia caused by *Streptococcus pneumoniae* (*Diplococcus pneumoniae*), *Haemophilus influenzae*, and *S. pyogenes* (group A beta-hemolytic streptococci). Appropriate culture and susceptibility studies should be performed to determine susceptibility of the causative organism to Cefclor.

Contraindication: Cefclor is contraindicated in patients with known allergy to the cephalosporin group of antibiotics.

Warnings: IN PENICILLIN-SENSITIVE PATIENTS, CEPHALOSPORIN ANTIBIOTICS SHOULD BE ADMINISTERED CAUTIOUSLY. THERE IS CLINICAL AND LABORATORY EVIDENCE OF PARTIAL CROSS-ALLERGENICITY OF THE PENICILLINS AND THE CEPHALOSPORINS, AND THERE ARE INSTANCES IN WHICH PATIENTS HAVE HAD REACTIONS, INCLUDING ANAPHYLAXIS, TO BOTH DRUG CLASSES.

Antibiotics, including Cefclor, should be administered cautiously to any patient who has demonstrated some form of allergy, particularly to drugs.

Pseudomembranous colitis has been reported with virtually all broad-spectrum antibiotics (including macrolides, semisynthetic penicillins, and cephalosporins), therefore, it is important to consider its diagnosis in patients who develop diarrhea in association with the use of antibiotics. Such colitis may range in severity from mild to life-threatening.

Treatment with broad-spectrum antibiotics alters the normal flora of the colon and may permit overgrowth of clostridia. Studies indicate that a toxin produced by *Clostridium difficile* is one primary cause of antibiotic-associated colitis.

Mild cases of pseudomembranous colitis usually respond to drug discontinuance alone. In moderate to severe cases, management should include sigmoidoscopy, appropriate bacteriologic studies, and fluid, electrolyte, and protein supplementation. When the colitis does not improve after the drug has been discontinued, or when it is severe, oral vancomycin is the drug of choice for antibiotic-associated pseudomembranous colitis produced by *C. difficile*. Other causes of colitis should be ruled out.

Precautions: General Precautions—If an allergic reaction to Cefclor occurs, the drug should be discontinued, and, if necessary, the patient should be treated with appropriate agents, e.g., pressor amines, antihistamines, or corticosteroids.

Prolonged use of Cefclor may result in the overgrowth of nonsusceptible organisms. Careful observation of the patient is essential. If superinfection occurs during therapy, appropriate measures should be taken.

Positive direct Coombs' tests have been reported during treatment with the cephalosporin antibiotics. In hematologic studies or in transfusion cross-matching procedures when antiglobulin tests are performed on the minor side or in Coombs' testing of newborns whose mothers have received cephalosporin antibiotics before parturition, it should be recognized that a positive Coombs' test may be due to the drug.

Cefclor should be administered with caution in the presence of markedly impaired renal function. Under such conditions, careful clinical observation and laboratory studies should be made because safe dosage may be lower than that usually recommended.

As a result of administration of Cefclor, a false-positive reaction for glucose in the urine may occur. This has been observed with Benedict's and Fehling's solutions and also with Clinitest® tablets but not with Tes-Tape® (Glucose Enzymatic Test Strip, USP, Lilly).

Broad-spectrum antibiotics should be prescribed with caution in individuals with a history of gastrointestinal disease, particularly colitis.

Usage in Pregnancy—Pregnancy Category B—Reproduction studies have been performed in mice and rats at doses up to 12 times the human dose and in ferrets given three times the maximum human dose and have revealed no evidence of impaired fertility or harm to the fetus due to Cefclor. There are, however, no adequate and well-controlled studies in pregnant women. Because animal reproduction studies are not always predictive of human response, this drug should be used during pregnancy only if clearly needed.

Nursing Mothers—Small amounts of Cefclor have been detected in mother's milk following administration of single 500-mg doses. Average levels were 0.18, 0.20, 0.21, and 0.16 mcg/ml at two, three, four, and five hours respectively. Trace amounts were detected at one

Some ampicillin-resistant strains of *Haemophilus influenzae*—a recognized complication of bacterial bronchitis*—are sensitive to treatment with Cefclor.¹⁻⁶

In clinical trials, patients with bacterial bronchitis due to susceptible strains of *Streptococcus pneumoniae*, *H. influenzae*, *S. pyogenes* (group A beta-hemolytic streptococci), or multiple organisms achieved a satisfactory clinical response with Cefclor.⁷

Cefclor®
cefclor
Pulvules®, 250 and 500 mg

hour. The effect on nursing infants is not known. Caution should be exercised when Cefclor® (cefclor, Lilly) is administered to a nursing woman.

Usage in Children—Safety and effectiveness of this product for use in infants less than one month of age have not been established.

Adverse Reactions: Adverse effects considered related to therapy with Cefclor are uncommon and are listed below.

Gastrointestinal symptoms occur in about 2.5 percent of patients and include diarrhea (1 in 70).

Symptoms of pseudomembranous colitis may appear either during or after antibiotic treatment. Nausea and vomiting have been reported rarely.

Hypersensitivity reactions have been reported in about 1.5 percent of patients and include morbilliform eruptions (1 in 100), Pruritus, urticaria, and positive Coombs' tests each occur in less than 1 in 200 patients. Cases of serum-sickness-like reactions (erythema multiforme or the above skin manifestations accompanied by arthritis/arthritis, and, frequently, fever) have been reported. These reactions are apparently due to hypersensitivity and have usually occurred during or following a second course of therapy with Cefclor.

Such reactions have been reported more frequently in children than in adults. Signs and symptoms usually occur a few days after initiation of therapy and subside within a few days after cessation of therapy.

No serious sequelae have been reported. Antihistamines and corticosteroids appear to enhance resolution of the syndrome.

Cases of anaphylaxis have been reported; half of which have occurred in patients with a history of penicillin allergy.

Other effects considered related to therapy included eosinophilia (1 in 50 patients) and genital pruritus or vaginitis (less than 1 in 100 patients).

Causal Relationship Uncertain—Transitory abnormalities in clinical laboratory test results have been reported. Although they were of uncertain etiology, they are listed below to serve as alerting information for the physician.

Hepatic—Slight elevations of SGOT, SGPT, or alkaline phosphatase values (1 in 40).

Hematopoietic—Transient fluctuations in leukocyte count, predominantly lymphocytosis occurring in infants and young children (1 in 40).

Renal—Slight elevations in BUN or serum creatinine (less than 1 in 500) or abnormal urinalysis (less than 1 in 200).

(061782R)

*Many authorities attribute acute infectious exacerbation of chronic bronchitis to either *S. pneumoniae* or *H. influenzae*.
Note: Cefclor is contraindicated in patients with known allergy to the cephalosporins and should be given cautiously to penicillin-allergic patients.

Penicillin is the usual drug of choice in the treatment and prevention of streptococcal infections, including the prophylaxis of rheumatic fever. See prescribing information.

References

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Minnesota Medical Association

My Brother's Keeper

ROGER A. MACDONALD, M.D.* and BARBARA E. MACDONALD, R.N.†

Alcohol and chemical abuse among physicians is a common, serious problem. This report reviews efforts of the Minnesota Medical Association (MMA) Physicians Concerned for Physicians Committee, established in 1976, to deal with the issue.

PHYSICIAN IMPAIRMENT has emerged as a major concern during the past few years. Current medical literature documents an impairment rate of 10 to 12% of all practicing physicians.¹⁻⁷ It is estimated that various forms of chemical abuse and dependency, including alcoholism, comprise 80 to 85% of these cases. The balance represents a variety of neurological and psychiatric dysfunctions. An M.D. degree does not confer immunity to senility, affective disorders, or schizophrenia any more than to alcohol or drug addiction. Because chemical and alcohol abuse constitute a majority of cases of physician impairment, much of the growing professional attention centers on this area. Identification of chemical dependency (including alcoholism) as an illness has introduced a degree of orderliness to a matter previously tangled and confused. Alcoholism provided enough enigmas to require a vote of the American Medical Association to be so designated. Nevertheless, the disease has a progression that is, in some ways, more predictable as to course and prognosis than diabetes or congestive heart failure. A basic problem becomes one of definition. For the purposes of this discussion we will include various degrees of malfunction induced by alcohol and drugs as chemical abuse. Any behavior associated with their use, that causes trouble for the physician, his family, colleagues, or patients, will be included. Such a pragmatic definition certainly includes addiction, whether physiological or psychological. It also covers the less well-defined problem of the occasional abuser who still traps himself into errors of judgment as a result. The elusive differences between those of us who can get away with exposure to mood-altering substances and those of us who addict from such experiences will not be addressed.

Just how big a problem is physician impairment due

to chemical abuse? Fleming¹ and Maguire⁸ estimate a total of 17,000 United States physicians who are so afflicted. Green, Carroll, and Buxton⁹ report the figure more likely at 25,000 nationwide. Talbott and Benson² reported on their experience in 1980, and they have concluded that, "one of every eight physicians in Georgia has been, is, or will be afflicted with the disease of chemical dependency — 12-14%." R. M. Murray⁴ writing in 1978 in Great Britain found that M.D.s in general are 19% less likely to die overall compared to the general population. In only three categories do physicians have a higher than average death rate — these three by a significant degree. They are in order of occurrence:

(1) suicide, (2) cirrhosis of the liver (practically always due to alcoholism) (3) accident (and how often are suicide and acute alcoholic intoxication smoothed over by a diagnosis of "accident"?).

A Mayo Clinic study showed that 50% of their doctor/patients with psychiatric disease were addicted to drugs or alcohol. Vaillant¹⁰ found that 16% of the physicians followed in his prospective study were involved in heavy drinking by the age of 46. Using this figure, plus information gleaned from his own experience, Ellard³ calculates a possible 20% of Australian physicians as seriously involved with chemicals.

There is an additional dimension to this whole problem of physician dysfunction because of chemical abuse. While formal documentation is much more fragmentary, experienced workers in the area of chemical dependency among professional families are well aware of the rate of illness among the spouses of physicians that is at least as high as the cited 10%, if not higher. A family living with a chemically dependent person is a *chaotic* one! A distracted, unhappy, fatigued physician who has been up all night involved in a bitter quarrel with an inebriated spouse, is clearly less responsible than a contented, rested one. There is also evidence that children of physicians have a higher than average involvement with chemicals and acting-

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out behavior. How can we reckon with the enervating effects of such a strain?

If we do a little mental arithmetic based on the above statistics, and take into account the approximately 7,000 licensed physicians practicing and residing in the State of Minnesota, it is obvious we are talking about 700 to 750 candidates for physician impairment due to chemical abuse. This does not even allow for the additional 700 to 800 chaotic families in which another member of the family is ill. Are this many of our colleagues so afflicted? Not clearly and obviously. A moment's thought can show how difficult the identification problem can be. Start with denial — a universal component of the illness. Add enabling ("covering up"), that essential contribution of those non-abusing relatives, friends, colleagues and even poorly cared for patients. Mix in erratic behavior — the confounding fact that it is rare indeed that each and every act of the afflicted person is crazy or inappropriate (it is from this point that so much of the doubt and confusion originates; that makes confrontation and identification of an ill physician such a slippery problem.) Lastly we need to recall that this is a disease of progression — that the "Minnesota 700" so to speak — are most certainly at various stages of the disease. Then top off such an elusive figure for identification with the fact of the average doctor's reluctance to challenge a colleague — the proverbial three-monkey approach of "no-see, no-hear, no-tell." Is it really any wonder that our afflicted 700 brothers and sisters have not all been identified?

What is being done to deal with this pandemic illness of physicians? Nationally, meaningful attention began to be focused on the problem about 1970. In 1972 the AMA House of Delegates adopted a policy statement proclaiming it "the ethical responsibility of every physician who became aware of an apparent problem in a colleague to take affirmative action — to seek treatment or rehabilitation for his fellow physician."¹¹ In 1975 the first of several national meetings of workers in the field, sponsored by the AMA Council on Mental Health, was held. In 1977¹² and 1978¹³ further conferences were convened. At the present time all but 5 or 6 states have developed programs to help deal with impaired colleagues. Two basic philosophies prevail — coercive and noncoercive. Whenever coercive powers are built into a program, it assumes a certain role of policing. In noncoercive models the emphasis is upon persuasion and helpfulness.

The birthdate of the Minnesota Medical Association Impaired Physician Committee was June 1, 1976. Dr.

Thomas Briggs, a long-time leader in the field of alcoholism treatment, was named as committee chairman, a duty he continues to fulfill. For practical purposes the work of this committee has been performed by a few dedicated and insightful volunteers. Gradually a small cadre of contact people — fellow practitioners all — quietly made themselves available. Referrals are received from many sources — families, colleagues, non-M.D. hospital and clinic professionals, and even patients. A noncoercive approach is the backbone of the committee's policy. (In a very small handful of recalcitrant cases where persuasion has been unavailing, and where serious dysfunction threatening to patient welfare has been found to exist, referral to the State Board of Medical Licensure has been used as a last resort.) Since 1976 a total of 186 referrals have been handled. Using the low-key techniques described, outcomes have been successful more often than not. In some cases, investigation has turned up no convincing evidence of impairment. Confidentiality is a most jealously guarded principle of the program and records are deliberately skimpy and available to no one outside of the committee itself. (Not even the parent MMA.) During the past years financing has been minimal, with most of the activities, in effect, financed by committee members. Recognizing the need for a much more systematic approach to the problem, particularly regarding follow-up, the committee (1982) submitted a budget request of \$20,000 for operating expenses. Of the 186 cases processed to date, over 75% were for dysfunction due to alcoholism. A smaller number were for other drug usage, and a few cases represented alcohol-prescription drug addiction in combination. A very small handful of the cases were for senility and psychiatric disorder other than the above.

During the past year committee members became aware that the name "Impaired Physician Committee" connoted a distinct policeman quality. Therefore, in order to emphasize its stance of colleague advocacy, the committee voted to change its name to "Physicians Concerned for Physicians." As a further offshoot of this group's activities, an AA-based organization called Physicians Serving Physicians and composed of chemically dependent doctors was initiated. This group meets regularly and welcomes referral of addicted physicians at any time. Also during the past year or so the committee has set up liaison arrangements with a number of other professional organizations including those of the law profession, dentistry, pharmacy and veterinarian medicine. These

contacts have been both helpful and inspirational for all concerned.

What does the future hold for this important activity within the Minnesota Medical Association? Issues of concern to the Physicians Concerned for Physicians Committee abound. They might be considered under the following:

1. Clarify our image regarding goals and attitudes of the committee. While the main thrust of the efforts of this committee are toward advocacy for our impaired colleagues, and our determination to help family and friends of such physicians get into appropriate treatment centers, we also recognize a bottom-line responsibility to society that involves a determination to see that patients are protected.
2. Provide educational outreach and help establish smoothly functioning referral networks, especially in the outstate, rural areas where isolation can effectively prolong the time before identification.
3. Secure adequate financing to carry on this important function.
4. Assess the impact of chemical abuse by spouses and other medical family members. This may be one of the most valuable future considerations of this committee and all who are concerned with physician impairment.
5. Consider the implications of identifying chemically-abusing students. It is a basic precept of good medical care that disease identified early is easier to control. As we begin to improve our capabilities of identifying chemically abusing students and encouraging them to come forth when they discover themselves in trouble, we then have a major responsibility to help them to receive treatment and to remain within the mainstream of their educational experience. A preliminary pilot study we have just completed points up the lack of any consistent policies regarding acceptance of students who have achieved sobriety after chemical abuse and who are now applying for residencies. Program directors need to acquaint themselves with the generally favorable outcome of treatment for alcoholic/CD physicians.
6. We need to consider the impact of a quiet

revolution that has been going on in our midst almost unnoticed. As women capture 40 to 50% of medical school slots, will this create any change in impairment patterns? There are a couple of ominous statistics to keep in mind when considering this question. Welner, A.¹⁴ discovered a rate of depression among female physicians in training of 40%. A number of studies have documented a suicide rate among female physicians higher than among male counterparts — a grim statistic indeed, when one reflects that suicide is the headliner mortality statistic among physicians in general.

In conclusion this account has brought into focus the major problem of physician impairment with particular emphasis on that majority portion of cases represented by chemical abuse. Like a dimly-perceived shape emerging from the morning fog of one of our numerous lakes, it is becoming increasingly apparent that not only does a problem exist, but that it has definition. Attitudes are changing. From a time of secrecy, pain, despair and erratic behavior, we are moving into an era of clarity, understanding and optimism. The Physicians Concerned for Physicians Committee of your state medical society needs your help. As practicing physicians we all need to educate ourselves as to the extent and nature of the world-wide disease of alcoholism/chemical dependency. We need to remind ourselves that we indeed are at risk. We need to teach our residents and students of the special hazard they have unwittingly accepted by their decision to enter medicine. We need to look around with new vision, a clear eye. This clarity of vision should begin as we survey ourselves in the mirror; as we work with friends and colleagues; as we serve on hospital committees. We need to develop courage in accepting the meaning of our observations and a willingness to act on behalf of our struggling impaired colleagues. We need help in establishing smoothly operating channels of communication throughout the state and in referral when problems exist. We need to take seriously enough this activity, that it is adequately financed at the state level.

When the biblical question, "Am I my brother's keeper?" is asked of us, how can we answer in any way other than the affirmative on behalf of our ill, hurting friends and colleagues?

See references, page 394

Minnesota Department of Health

Evaluation of the Effect of Record Source on the Profiles of Patients with Diabetes Mellitus in Wadena, Minnesota

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Of the 150 people with diabetes living in Wadena anytime from January 1, 1979 to July 1, 1981, only 70 (47%) would have been identified if the hospital was the only source used for identification. Profiles comparing those found using the hospital as the sole source of identification and those found using other sources of identification revealed several differences. Profiles of diabetic individuals found through the hospital and clinic, pharmacy, public health nursing, diabetes teaching team, nursing home, and survey are also presented.

Frequency of medical contact (clinic and hospital) varied over strata based upon time since diagnosis. This relationship was found to be a function of two different profiles of medical encounters in individuals with Type II diabetes. Without the population-based methodology, the difference in Type II profiles may have been missed. Similar studies now in progress in Marshall and Grand Rapids, Minnesota will provide valuable contrasts.

THERE ARE MANY sources that can be used to identify diabetic individuals living in a community. The hospital, clinic, public health nursing, diabetes teaching team, pharmacies, referral hospitals, nursing home, and mail surveys were used to ascertain all individuals diagnosed by a physician as having diabetes mellitus and living in Wadena, Minnesota (population 4,699, 1980) during the period of January 1, 1979 to July 1, 1981.^{1,2} In addition to ascertainment, these sources provided records that were abstracted into a medical profile for each person with diabetes. This report summarizes the profiles of Wadena diabetic residents as seen through the "windows" provided by each identifying source. Comparison of these profiles provides an opportunity to evaluate potential biases inherent in non-population-based studies of diabetes.

Dependence of the Wadena diabetic's medical profile on current age, gender, age at diagnosis, diabetic type, and length of time since diagnosis will also be examined in this report.

Methods

The general methods used for identification of people with diabetes and construction of their medical profiles have been described previously.^{1,2} Multiple linear regression was used to study the role of age, gender, age at diagnosis, and length of time since clinical diagnosis on medical profiles.³

Results

Hospitals are frequently used as the only source for epidemiologic studies of diabetes. In Wadena, 70 of 150 individuals with diabetes (47%) would have been identified using hospital records as the sole source of diabetic information. Thirty-seven additional subjects had hospital records but were not included in the Professional Activity Study (PAS) abstracts and were later found through secondary sources. Twenty-four of the thirty-seven had no hospitalizations during the study period, ten had hospitalizations listed on PAS abstracts that indicated addresses outside the city limits of Wadena at the time of hospitalization, and three had hospitalizations that involved diabetes but a diagnosis of diabetes was not included in the first five discharge diagnoses. Therefore, of the total eligible 107 diabetics with hospitalizations, 70 (65%) would have been included in a study based solely on hospital records.

Comparison of both clinic and hospital record profiles for the 70 that were identified from hospital

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Study approved by the Committee on the Use of Human Subjects in Research, University of Minnesota.

records to the 80 identified from other sources are given in Tables 1 and 2. Significant differences in demographic variables, medical history, and medical profiles were observed. Most striking were the 3-fold increase in the female to male ratio, the increased number of major health problems, the greater proportion of diabetics initially treated with insulin and the increased utilization of public health nursing by the 70 identified using only hospital records compared to the 80 individuals identified from other sources.

One hundred twenty-nine of the 150 individuals (86%) would have been found using both clinic and hospital records as the only sources of identification. Comparisons between the 129 individuals identified from clinic and hospital records, and the 21 individuals identified through secondary sources are given in Tables 3 and 4. Overall, the two profiles were quite similar.

The diabetic individuals found in the pharmacy, public health nursing, diabetes teaching team, nursing home records and through the two mail surveys were also individually profiled.⁴ A summary of these profiles is given in Table 5.

To evaluate the effect of time since diabetes diagnosis on the observed rates and reasons for medical encounters, the Wadena diabetics were stratified into four cohorts based upon time since diagnosis. The criteria for stratification were: time since diagnosis less than or equal to five years = cohort 1; time since diagnosis greater than five years and less than or equal to ten years = cohort 2; time since diagnosis greater than 10 years = cohort 3. Cohort 4 consisted of individuals for whom only an approximate date of diagnosis was available and the time since diagnosis was considered unknown. Major reasons for clinic medical encounters by time since diagnosis are given

TABLE 1
Profiles of Diabetic Individuals Found in
Hospital Records as Primary Source Compared to all Others

	Hospital Records (N = 70)	Other Sources (N = 80)
Positive Family History	54%*	35%
Female: Male Ratio	3.7*	1.2
Average Number of Major Health Problems†	5.9*	3.5
Average Age at Diagnosis	61.8 years	61.2 years
Average Length of Follow-up	7.7 years	6.8 years
Initial Treatment Included:††		
Insulin	13%*	4%
Oral Agents	70%	52%
Original Symptoms Included:††		
Polyuria, Polydipsia or Polyphagia	20%	22%
Subjects had:		
Pharmacy Records	41%	35%
Public Health Nursing Records	24%	9%
Diabetes Teaching Team Records	13%	14%
Nursing Home Records	31%	19%

*Significantly different at $p = 0.05$ level

†A major health problem was defined as any other chronic disease or condition that required repeated medical attention or lengthy hospitalization.

††Based upon clinic records at time of diagnosis

TABLE 2
Clinic and Hospital Profiles of Diabetic Individuals Identified
Through Hospital Records (H) Compared to
Those (O) Identified Through Other Sources

Reasons for Encounters Per Year†	Clinic		Hospital	
	H	O	H	O
Metabolic Complications	0.9	0.8	0.9	0.7
Routine Diabetes	5.3	4.3*	0.02	0.2
Renal	0.07	0.01	0.04	0.01
Eye	0.4	0.5	0.09	0.07
Neurologic	0.3	0.2	0.2	0.2
Infection	1.0	0.8	0.4	0.3
Cardiovascular	1.4	1.1	1.0	0.7
Other	3.4	2.3*	1.0	1.1
Number of Visits	10.1	8.4*	1.2	1.2

*Difference is significant at the $p = .05$ level

†See Reference 2 for description of categories

in Table 6. The relationship between hospitalization and times since diagnosis (for the 107 with hospital records) provided a qualitatively similar picture and is not presented here.⁴

From Table 6, it can be seen that the average number

of clinic visits varies widely from the overall average of 9.2.² There appeared to be a downward trend from 12.7 to 6.4 visits per year with increasing time since diagnosis. This overall trend was confirmed through multiple regression of the average number of clinic

TABLE 3

Profiles of Diabetic Individuals Found in Hospital and Clinic Records
As Primary Sources Compared to All Others

	Hospital and Clinic Records (N = 129)	Other Sources (N = 21)
Positive Family History	45%	33%
Female: Male Ratio	2.0	1.6
Average number of major health problems †	4.7*	3.5
Average age at diagnosis	61.6 years	60.9 years
Average length of follow-up	7.4 years	6.2 years
Initial treatment included: ††		
Insulin	10%	8%
Oral Agents	63%	58%
Original Symptoms Included: ††		
Polyuria, Polydipsia, or Polyphagia	20%	35%
Subjects had:		
Pharmacy records	43%*	9%
Public Health Nursing Records	16%	14%
Diabetes Teaching Team Records	13%	14%
Nursing Home Records	22%	38%

*Significantly different at $P = 0.05$ level

†A major health problem was defined as any other chronic disease or condition that required repeated medical attention of lengthy hospitalization

††Based upon clinic records at time of diagnosis

TABLE 4

Clinic and Hospital Profiles of Diabetic Individuals Identified through
Hospital and Clinic Records (HC) Compared to Those
Identified Through Other Sources (NHC)*

Reasons For Encounter Per Year†	Clinic		Hospital	
	HC	NHC	HC	NHC
Metabolic Complications	0.8	0.7	0.8	1.4
Routine Diabetes	4.7	5.1	0.03	0.4
Renal	0.04	0.03	0.03	0.03
Eye	0.5	0.5	0.1	0.2
Neurologic	0.3	0.3	0.1	0.4
Infection	0.9	1.0	0.3	0.3
Cardiovascular	1.2	1.8	0.9	1.3
Other	2.8	3.2	0.8	2.6
Number of Visits	9.0	10.5	1.1	2.6

*None of the differences were statistically different at the $p = 0.05$ level.

†See reference 2 for description of categories.

TABLE 5

Summary Profiles of Diabetic Individuals Found Through Pharmacy,
Public Health Nursing, Diabetes Teaching Team,
Nursing Home Records and by Survey

	Pharmacy	Public Health Nursing	Diabetes Teaching Team	Nursing Home	Survey
Number of Individuals	57	24	20	37	51
Female: Male Ratio	2.4	3.0	2.3	2.4	1.4
Average Number of Major Health Problems	4.2	6.0	5.6	5.7	4.0
Average Age at Diagnosis	64.6	66.2	57.3	71.3	50.8
Average Length of Follow-up	6.5	9.2	8.4	7.0	7.4
Average Number of Clinic Visits Per Year	9.1	11.0	9.2	12.6	8.2
Average Number of Hos- pitalization Per Year	1.0	1.5	1.0	1.3	1.3

visits with the time since diagnosis, gender, age at diagnosis, and current age. Only time since diagnosis was significantly associated ($p < 0.05$) with the average number of visits. Figure 1 demonstrates the linear regression relationship between time since diagnosis and clinic visits per year.

Table 7 demonstrates that the apparent downward population trend in clinic visits with increasing time from diagnosis was not shared by all diabetics. Following the three cohorts defined by their time since diagnosis, two distinct patterns were seen. Cohorts 1 and 3 had relatively constant rates of clinic visits over time, while cohort 2 experienced an increase in its rate. The recently diagnosed diabetic individuals (cohort 1) had about 12.7 visits per year and those diagnosed more than 10 years ago, (cohort 3) had an almost constant rate of 6.4 visits per year. The apparent increase to 7.7 per year in cohort 3 in recent years (Table 7) was not statistically elevated above 6.4. Cohort 2 experienced a statistically significant increase from 6.9 to 10.8 clinic visits per year. These cohort relationships compared to the overall diabetic population (from Figure 1) are depicted in Figure 2.

A close examination of cohort 2 revealed that it was the only cohort of the three to have experienced excess mortality. However, the excess was not statistically significant. The major contributor to the increase in clinic visits over time for this cohort was for routine diabetes care. Visits for cardiovascular problems had a more modest increase over time and visits for metabolic complications in cohort 2 decreased slightly over time since diagnosis.

Several of the members of cohort 2 and cohort 3 were individuals with Type I diabetes (insulin using

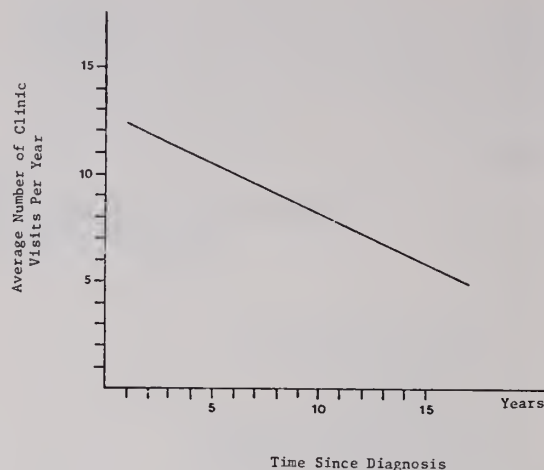


Fig. 1 — Average Number of Clinic Visits Per Year By Time Since Diagnosis.

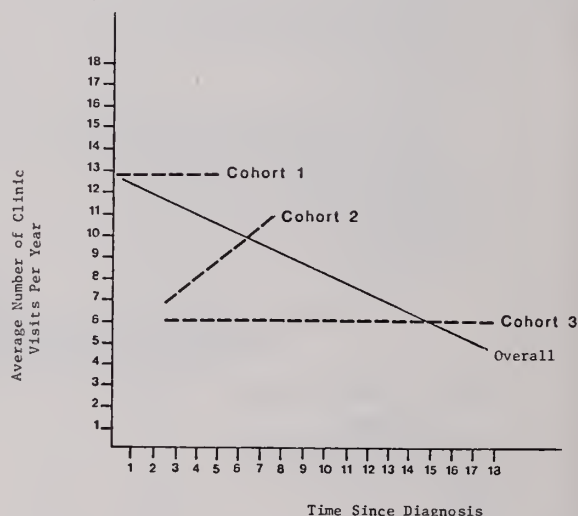


Fig. 2 — Average Number of Clinic Visits Per Year By Time Since Diagnosis.

TABLE 6

Reasons for Clinic Medical Encounter by Time Since Diagnosis of Diabetes				
Average Number of Clinic Encounters Per Year for Patients with Given Length of Follow-up				
	0-5 Years	5-10 Years	10+ Years	Unknown Years
Number of Patients	45	33	25	47
Metabolic Complications	1.4	0.4	0.3	0.9
Routine Diabetes Care	5.9	4.5	3.8	4.3
Cardiovascular	1.9	1.0	0.5	1.4
Total	12.7	7.8	6.4	8.3

TABLE 7

Average Number of Clinic Visits for Cohorts Defined By Time Since Diagnosis

Cohort	Time Since Diagnosis			
	0-2.5 Years	2.5-5 Years	5-10 Years	10+ Years
(1) Less than 5 Years	12.8	12.6		
(2) Between 5 and 10 Years	5.9	6.9	10.8	
(3) More than 10 Years	5.8	6.1	5.9	7.7

and age at diagnosis less than 25 years). All ten Type I's were excluded and the above analyses repeated with no changes in cohort effects or regression relationships. However, the multiple regression relationships of the ten Type I's were different than those for the Type II's. For individuals with Type I diabetes, gender and current age were the factors significantly associated with the number of clinic visits per year. Females had more visits ($p < 0.02$) and the number of visits decreased with age ($p < 0.001$). Therefore, the observation of the cohort differences in medical encounters over time since diagnosis was valid for those individuals with Type II diabetes only.

Discussion

It must be emphasized that the Wadena study was based upon abstracts of medical records. All of the summaries presented in this report represent only that which was explicitly stated in the medical records and not that which could be inferred. Inferences were not permitted as they would be dependent upon the training and experience of the persons reading the record. The objective abstraction of medical records lends itself to reproducibility but also generates incomplete information. This was obviously the case for diagnostic regimens, presenting signs and symptoms of the patient and follow-up histories, where more information would have been available if some interpretation of the medical record had been allowed.

The reproducibility of the abstraction process was documented through a 10 percent sample reabstraction by a second abstractor. Subjectivity could have been incorporated into the coding of the number of major health problems during the follow-up period or the classification of reasons for clinic visit or hospitalization. However, one coder made all of these decisions which guaranteed relative comparability and blind recoding by the same coder demonstrated consistency and reproducibility of these coding decisions.

The results from the Wadena study describe the medical profiles of all persons with diabetes in Wadena. A descriptive study of 150 people with diabetes has many limitations and extrapolation of these profiles to other populations must be done with caution. For example, the apparent existence of two different profiles for individuals with Type II diabetes could be specific to Wadena or it could be indicative of the natural history of the disease.

The apparent increase in medical encounters over time and excess mortality of cohort 2 compared to cohorts 1 and 3 (Figure 2) could be interpreted that

cohort 2 had more severe diabetes than cohorts 1 and 3. Although the follow-up periods were relatively short (maximum of 15 years for cohort 3) cohorts 1 and 3 had consistent patterns of medical encounters while cohort 2 had a different profile. This observation could be consistent with the existence of subtypes of Type II diabetes.⁵

Since it has been documented that obesity is associated with insulin resistance,⁶ it would have been valuable to evaluate the potential effects of obesity differences among these cohorts. However, height was generally unavailable in the medical record and an obesity index could not be calculated. If these cohort differences represented a difference in biologic type of Type II (for example, insulin deficiency versus insulin resistance)^{7,8} then the Wadena study could have wider generalization.

The cohorts were defined in terms of length of time from diagnosis. Therefore, a biologic explanation for cohort differences is tenuous. A more plausible explanation for the observed differences is that clinic visits for patients in the second cohort were elevated toward the higher rate of cohort 1 due to changes in medical practice. This explanation is consistent with the fact that most of the increase in clinic visits for Wadena cohort 2 was for routine diabetes care and would, therefore, be more specific to Wadena.

Existence of cohort differences in medical profiles is an important factor to consider when evaluating a diabetic community. Without population-based methodology, it would have been possible to have profiled a particular cohort and believed it to reflect the profile of the entire population.

The results in Tables I-6 provide additional insights into potential misrepresentations of non-population-based studies. Hospital records in particular would have provided a biased view of diabetes in Wadena. Significant differences in family history, female to male ratio, number of major health problems, insulin using proportion, requirement for public health nursing, and clinical profiles would have made diabetes appear to be a more severe and more female disease than it was in Wadena.

The robustness of the quantitative profiles of the Wadena diabetic population can only be evaluated through comparison of the results with those of other cities. Currently, Marshall and Grand Rapids, Minnesota are being studied with the same methods used in Wadena. The results of these studies will provide valuable contrasts.

See references, page 394.

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Bactrim™ DS

(trimethoprim and sulfamethoxazole/Roche)

Before prescribing, please consult complete product information, a summary of which follows:

Indications and Usage: For the treatment of urinary tract infections due to susceptible strains of the following organisms: *Escherichia coli*, *Klebsiella-Enterobacter*, *Proteus mirabilis*, *Proteus vulgaris*, *Proteus morganii*. It is recommended that initial episodes of uncomplicated urinary tract infections be treated with a single effective antibacterial agent rather than the combination. Note: The increasing frequency of resistant organisms limits the usefulness of all antibacterials, especially in these urinary tract infections.

For acute otitis media in children due to susceptible strains of *Haemophilus influenzae* or *Streptococcus pneumoniae* when in physician's judgment it offers an advantage over other antimicrobials. To date, there are limited data on the safety of repeated use of Bactrim in children under two years of age. Bactrim is not indicated for prophylactic or prolonged administration in otitis media at any age.

For acute exacerbations of chronic bronchitis in adults due to susceptible strains of *Haemophilus influenzae* or *Streptococcus pneumoniae* when in physician's judgment it offers an advantage over a single antimicrobial agent.

For enteritis due to susceptible strains of *Shigella flexneri* and *Shigella sonnei* when antibacterial therapy is indicated.

Also for the treatment of documented *Pneumocystis carinii* pneumonitis.

Contraindications: Hypersensitivity to trimethoprim or sulfonamides; patients with documented megaloblastic anemia due to folate deficiency; pregnancy at term; nursing mothers because sulfonamides are excreted in human milk and may cause kernicterus; infants less than 2 months of age.

Warnings: BACTRIM SHOULD NOT BE USED TO TREAT STREPTOCOCCAL PHARYNGITIS. Clinical studies show that patients with group A β -hemolytic streptococcal tonsillopharyngitis have higher incidence of bacteriologic failure when treated with Bactrim than do those treated with penicillin. Deaths from hypersensitivity reactions, hepatocellular necrosis, agranulocytosis, aplastic anemia and other blood dyscrasias have been associated with sulfonamides. Experience with trimethoprim is much more limited but occasional interference with hematopoiesis has been reported as well as an increased incidence of thrombopenia with purpura in elderly patients on certain diuretics, primarily thiazides. Sore throat, fever, pallor, purpura or jaundice may be early signs of serious blood disorders. Frequent CBC's are recommended; therapy should be discontinued if a significantly reduced count of any formed blood element is noted.

Precautions: General: Use cautiously in patients with impaired renal or hepatic function, possible folate deficiency, severe allergy or bronchial asthma. In patients with glucose-6-phosphate dehydrogenase deficiency, hemolysis, frequently dose-related, may occur. During therapy, maintain adequate fluid intake and perform frequent urinalyses, with careful microscopic examination, and renal function tests, particularly where there is impaired renal function. Bactrim may prolong prothrombin time in those receiving warfarin; reassess coagulation time when administering Bactrim to these patients.

Pregnancy: Teratogenic Effects: Pregnancy Category C. Because trimethoprim and sulfamethoxazole may interfere with folate metabolism, use during pregnancy only if potential benefits justify the potential risk to the fetus.

Adverse Reactions: All major reactions to sulfonamides and trimethoprim are included, even if not reported with Bactrim. Blood dyscrasias: Agranulocytosis, aplastic anemia, megaloblastic anemia, thrombopenia, leukopenia, hemolytic anemia, purpura, hypoprothrombinemia and methemoglobinemia. Allergic reactions: Erythema multiforme, Stevens-Johnson syndrome, generalized skin eruptions, epidermal necrolysis, urticaria, serum sickness, pruritus, exfoliative dermatitis, anaphylactoid reactions, periorbital edema, conjunctival and scleral injection, photosensitization, arthralgia and allergic myocarditis. Gastrointestinal reactions: Glossitis, stomatitis, nausea, emesis, abdominal pains, hepatitis, hepatocellular necrosis, diarrhea, pseudomembranous colitis and pancreatitis. CNS reactions: Headache, peripheral neuritis, mental depression, convulsions, ataxia, hallucinations, tinnitus, vertigo, insomnia, apathy, fatigue, muscle weakness and nervousness. Miscellaneous reactions: Drug fever, chills, toxic nephrosis with oliguria and anuria, periarthritis nodosa and L.E. phenomenon. Due to certain chemical similarities to some goitrogens, diuretics (acetazolamide, thiazides) and oral hypoglycemic agents, sulfonamides have caused rare instances of goiter production, diuresis and hypoglycemia in patients; cross-sensitivity with these agents may exist. In rats, long-term therapy with sulfonamides has produced thyroid malignancies.

Dosage: Not recommended for infants less than two months of age. URINARY TRACT INFECTIONS AND SHIGELLOSIS IN ADULTS AND CHILDREN, AND ACUTE OTITIS MEDIA IN CHILDREN:

Adults: Usual adult dosage for urinary tract infections—1 DS tablet (double strength), 2 tablets (single strength) or 4 teasp. (20 ml) b.i.d. for 10-14 days. Use identical daily dosage for 5 days for shigellosis.

Children: Recommended dosage for children with urinary tract infections or acute otitis media—8 mg/kg trimethoprim and 40 mg/kg sulfamethoxazole per 24 hours, in two divided doses for 10 days. Use identical daily dosage for 5 days for shigellosis.

For patients with renal impairment: Use recommended dosage regimen when creatinine clearance is above 30 ml/min. If creatinine clearance is between 15 and 30 ml/min, use one-half the usual regimen. Bactrim is not recommended if creatinine clearance is below 15 ml/min.

ACUTE EXACERBATIONS OF CHRONIC BRONCHITIS IN ADULTS:

Usual adult dosage: 1 DS tablet (double strength), 2 tablets (single strength) or 4 teasp. (20 ml) b.i.d. for 14 days.

PNEUMOCYSTIS CARINII PNEUMONITIS:

Recommended dosage: 20 mg/kg trimethoprim and 100 mg/kg sulfamethoxazole per 24 hours in equal doses every 6 hours for 14 days. See complete product information for suggested children's dosage table.

Supplied: Double Strength (DS) tablets, each containing 160 mg trimethoprim and 800 mg sulfamethoxazole, bottles of 100 and 500; Tel-E-Dose® packages of 100; Prescription Paks of 20. Tablets, each containing 80 mg trimethoprim and 400 mg sulfamethoxazole—bottles of 100 and 500; Tel-E-Dose® packages of 100; Prescription Paks of 40. Pediatric Suspension, containing 40 mg trimethoprim and 200 mg sulfamethoxazole per teaspoonful (5 ml), cherry flavored—bottles of 100 ml and 16 oz (1 pint). Suspension, containing 40 mg trimethoprim and 200 mg sulfamethoxazole per tea spoonful (5 ml); fruit-licorice flavored—bottles of 16 oz (1 pint).



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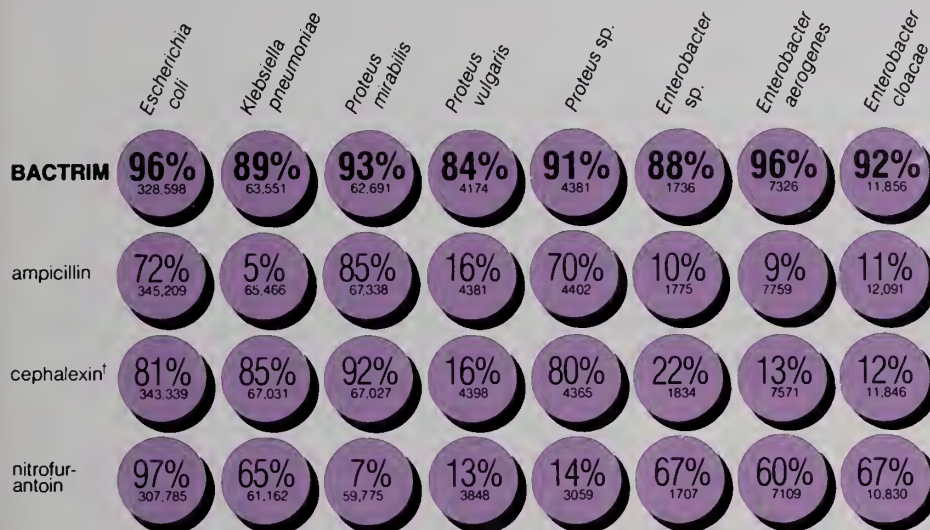
In vitro studies demonstrate



Bactericidal activity

with minimal resistance

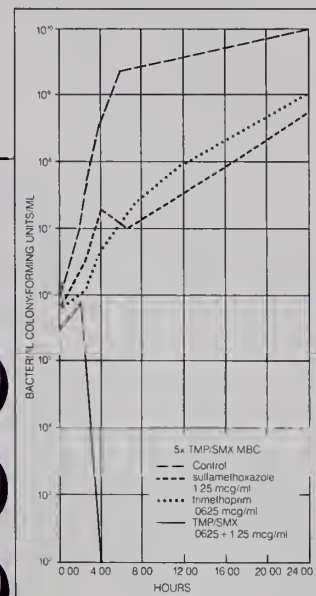
Percent of isolates of common uropathogens sensitive to BACTRIM and to other antimicrobials



[†]Analogous to cephalothin, the primary antibiotic disc used in testing.

Source: The Bacteriologic Report, BAC-DATA Medical Information Systems, Inc., Winter Series, 1981-82. Numbers under percentages refer to the projected number of isolates tested.

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Kill curve kinetics of Bactrim and its individual components against *E. coli* in vitro.[†]

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For assistance with scheduling meetings, please contact the MMA office (address and phone given below) for information on future medical meetings and CME courses at the state and national level.

Information for each entry is arranged as follows: Date: Name of program; Primary sponsor; Location; Contact person.

June, 1983

10-11 Clinical Hypnosis; Earle Brown Center; St. Paul; CONTACT: CME, U of M, Box 293 Mayo Memorial Bldg., 420 Delaware St. SE, Mpls., MN 55455, 612/373-8012.

10-11 Annual Meeting; Minnesota Obstetrical & Gynecological Society; Barker's Island, Superior, Wisconsin; CONTACT: Mrs. Cammy Kelley or Dr. Carolyn B. Coulam, Mayo Clinic, 200 1st St. SW, Rochester, MN 55905.

14, 21, 22 Basic Life Support Instructor Program; Methodist Hospital, Methodist Hospital; CONTACT: Mary Ann Kempcke, Methodist Hospital, 6500 Excelsior Blvd., P.O. Box 650, Mpls., MN 55440, 612/932-5167.

15-18 G.I. Surgery; U of M Medical School; Willey Hall West Bank, U of M, Mpls.; CONTACT: CME, U of M, Box 293, Mayo Memorial Bldg., 420 Delaware St. SE, Mpls., MN 55455, 612/373-8012.

19-24 Laryngectomy Rehabilitation Seminar; Mayo Clinic, Rochester; CONTACT: Postgraduate Courses, Mayo Clinic, 200 1st St. S.W., Rochester, MN 55905; 507/284-2085.

21 Sports Medicine — What is It?; Central Mesabi Medical Center; Central Mesabi Medical Center; CONTACT: Ben P. Owens, Mesaba Clinic, Hibbing, MN 55746; 218/262-3441.

23-25 Behavioral Pediatrics; U of M Medical School; U of M, St. Paul; CONTACT: CME, U of M, Box 293, Mayo Memorial Bldg., 420 Delaware St. SE, Mpls., MN 55455, 612/373-8012.

29-30 Human Aging VI; U of M; Mayo or Willey Hall, U of M; CONTACT: CME, U of M, Box 293 Mayo Memorial Bldg., 420 Delaware Street S.E., Mpls, MN 55455 612/373-8012.

30 Neonatal Resuscitation; North Memorial Medical Center; CONTACT: Martin Weems, M.D., 3300 Oakdale No., Robbinsdale, MN 55422; 612/520-5200

July, 1983

8-9 Women in Medicine Symposium; U of M Earle Brown Center, St. Paul; CONTACT: CME, U of M, Box 293 Mayo Memorial Bldg., 420 Delaware St. S.E., Minneapolis, MN 55455; 612/373-8012.

8-21 Orient-Express Adventure; North Central Medical Conference; CONTACT: Betty Schmid, North Central Medical Conference, 2221 University Ave. S.E., Suite 400, Minneapolis, MN 55414; 612/378-1875.

20 Cardio-Vascular Surgery Update; Central Mesabi Medical Center; Central Mesabi Medical Center; CONTACT: Ben P. Owens, Mesaba Clinic, Hibbing, MN 55746; 218/262-3441.

July 22-August 3 Main River Adventure, North Central Medical Conference; CONTACT: North Central Medical Conference, 2221 University Ave. S.E., Suite 400, Minneapolis, MN 55414; 612/378-1875.

July 28-30 Orthopaedic Surgery: Hip Replacement; U of M; Hyatt Regency Hotel, Nicollet Mall, Minneapolis, MN CONTACT: CME, U of M, Box 293 Mayo Memorial Bldg., 420 Delaware St. S.E., Minneapolis, MN 55455; 612/373/8012.

August, 1983

8-10 Limb Salvage & Reconstruction Application of Microvascular Techniques & Alternative Methods; Mayo Clinic; Rochester; CONTACT: Postgraduate Courses Mayo Clinic, 200 1st Street S.W., Rochester, Minnesota 55905; 507/284-2085.

16 The Menopause — Risks and Benefits of Estrogen Progestron Therapy; Central Mesabi Medical Center; Central Mesabi Medical Center; CONTACT: Ben P. Owens, Mesaba Clinic, Hibbing, MN 55746; 218/262-3441.

18-20 Leadbetter Symposium — Urolithiasis; U of M; Willey Hall; CONTACT: CME, U of M Box 293 Mayo Memorial Building, 420 Delaware Street S.E., Minneapolis, MN 55455, 612/373-8012.

22-24 Advanced Cardiac Life Support Course; North Memorial Medical Center; NMMC; CONTACT: William Nelson, 3300 Oakdale North, Robbinsdale, MN 55422; 612/520-5200.

25-26 Nursing Home Medical Directors Meeting; U of M; Mayo Memorial Auditorium; CONTACT: CME U of M, Box 293 Mayo Memorial Bldg., 420 Delaware St., S.E., Minneapolis, MN 55455; 612/373/8012.

September, 1983

9-10 Foot & Ankle Care of the Adult Patient; Mayo Clinic; Rochester; CONTACT: Postgraduate Courses, Mayo Clinic, 200 1st St. S.W., Rochester, MN 55905; 507/284-2085.

12-16 Radiology/83 Special Imaging; U of M; West Bank Auditorium, Willey Hall; CONTACT CME U of M, Box 293, Mayo Memorial Bldg., 420 Delaware Street S.E., Minneapolis, MN 55455; 612/373-8012.

(September continued)

16-17 Orthopedic Nursing in the 80's; Metropolitan Medical Center and Hennepin County Medical Center; Pillsbury Auditorium Hennepin County Medical Center; CONTACT: Rose Jagodzinski, 701 Park Ave. S., Orthopedic Office 813, Minneapolis, MN 55415; 612/347-2812.

16-17 Annual Meeting, Minnesota Orthopedic Society; Minneapolis; CONTACT: Jack M. Bert, M.D., 307 Gallery Medical Bldg., 17 W. Exchange St., St. Paul, MN 55102.

19-21 Pulmonary Disease — 1983; Mayo Clinic; Rochester; CONTACT: Postgraduate Courses, Mayo Clinic, 200 1st St. S.W., Rochester, MN 55905; 507/284-2085.

20 Annual Meeting, MN Psychiatric Society; Edgewood Restaurant, Cannon Falls; CONTACT: Donald J. Erickson, M.D. Emeritus, Mayo Clinic, Rochester, MN 55901.

21 Medical Chest; Central Mesabi Medical Center; Central Mesabi Medical Center; CONTACT: Ben P. Owens, Mesaba Clinic, Hibbing, MN 55746; 218/262-3441.

22-24 6th Annual Trauma and Critical Care Seminar; U of M; Hennepin County Medical Center; CONTACT: Donald M. Jacobs, HCMC, 701 S. Park, Minneapolis, MN 55415; 612/347-2810.

23-24 Advanced Trauma Life Support Course; American College of Surgeons State Committee on Trauma, UMD, and St. Luke's Hospital, Duluth, MN; CONTACT: Charles L. Barbee, M.D. ATLS Physician Course Director, 1000 First St., Duluth, MN 55805; 218/727-7259.

28-30 Obstetrics & Gynecology; U of M; Holiday Inn, Nicollet Mall, Minneapolis; CONTACT: CME, U of M Box 293 Mayo Memorial Bldg., 420 Delaware Street S.E., Mpls. MN 55455; 612/373-8012.

30 Northwestern Pediatric Society Annual Meeting; Chanhassen; CONTACT: Frederic Kleinberg, M.D., Mayo Clinic Rochester, MN 55905; 507/284-2922.

September 30-October 1 Vascular Disease; Methodist Hospital and St. Louis Park Medical Center Research Foundation; Radisson South; CONTACT: Elaine Anderson, Assistant Director of Medical Education, 5000 W. 39th Street, Minneapolis, MN 55416; 612/927-3703.

October, 1983

5-7 Internal Medicine Review (10th Annual Course); U of M, Mayo Memorial Auditorium CONTACT: CME, U of M, Box 293 Mayo Memorial Building, 420 Delaware Street, S.E., Minneapolis, MN 55455; 612/373-8012.

5, 11, 12 Basic Life Support Instructor Program; Methodist Hospital; Methodist Hospital; CONTACT: Mary Ann Kempcke, Methodist Hospital, 6500 Excelsior Blvd., P.O. Box 650, Minneapolis, MN 55440; 612/932-5167.

8 Current Trend in Ophthalmology — 7th Annual; Mount Sinai Hospital, Minneapolis; CONTACT: Evelyn Peterson, Medical Staff Office, Mount Sinai Hospital, 2215 Park Avenue, Minneapolis, MN 55404; 612/871-3700 ext. 1117.

12-15 Principles of Colon & Rectal Surgery; U of M; Mayo Memorial Auditorium, U of M; Mayo Memorial Auditorium, U of M; CONTACT: CME, U of M, Box 293 Mayo Memorial Building, 420 Delaware Street, SE, Minneapolis, MN 55455; 612/373-8012.

13-22 Advanced Cardiac Life Support Course; Methodist Hospital; Methodist Hospital; CONTACT: Joan Peterson, M.D. Methodist Hospital, 6500 Excelsior Blvd., P.O. Box 650, Minneapolis, MN 55440; 612/932-5419.

14 Cardiovascular Disease; U of M; CONTACT: CME, U of M, Box 293 Mayo Memorial Building, 420 Delaware St., S.E., Minneapolis, MN 55455; 612/373-8012.

14-15 5th Adolescent Medicine & Health Conference; U of M; Earle Brown Center, U of M; CONTACT: CME, U of M, Box 293 Mayo Memorial Building, 420 Delaware Street, S.E., Minneapolis, MN 55455; 612/373-8012.

14-16 Midwest Allergy Forum; Minnesota Allergy Society, Hyatt Regency, Minneapolis; CONTACT: Dr. Paul Steinberg, 5000 W. 39th Street, Minneapolis, MN 55416; 612/297-3091.

15 Annual Meeting of MN Chapter of American College of Physicians; Hyatt Regency, Minneapolis; CONTACT: Tom G. Bergstrom, M.D., 750 South Broadway, Cokato, MN 55321.

17-19 Recent Advances in Cardiac Catheterization; Mayo Clinic; Rochester; CONTACT: Postgraduate Courses, Mayo Clinic, 200 1st St. S.W., Rochester, MN 55905; 507/284-2085.

18 Antibiotic Update; Central Mesabi Medical Center; Central Mesabi Medical Center; CONTACT: Ben P. Owens, M.D., Mesaba Clinic, Hibbing, MN 55746; 218/262-3441.

19-21 Second Annual Course; Emergency Medicine for Primary Care Physicians; St. Paul-Ramsey Medical Center; St. Paul Hotel; CONTACT: Ruth McIntyre, St. Paul-Ramsey Medical Center, 650 Jackson Street, St. Paul, MN 55101; 612/221-3992.

23 Update in Cardiology; Mayo Clinic; Rochester; CONTACT: Postgraduate Courses, Mayo Clinic, 200 1st Street S.W., Rochester, MN 55905; 507/284-2085.

24-26 Clinical Reviews; Mayo Clinic; Rochester; CONTACT: Postgraduate Courses, Mayo Clinic, 200 1st Street, S.W., Rochester, MN 55905; 507/284-2085.

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Letters to the Editor

Dear Dr. Reece:

I enjoy your writing. Reece's Rules of Readability, printed in December, I thought worth saving. Then Dr. Martin Netsky dissoluted me: First, by second-guessing some of your usages and Second, by contributing two split infinitives "I have often used" and "are usually weak".

Your writing still rates number one with me.

Arthur J. Taylor
Edina, Minnesota

Dear Dick,

I enjoyed "Touché" in the February MINNESOTA MEDICINE, to say nothing of the editorial that prompted Dr. Netsky's reply.

In the circumstances, you had little choice but to accept all of Dr. Netsky's editorial changes, and you did so graciously, and in a manner that reinforced your message. Well done!

I will not resist the comment that while Dr. Netsky improved several sentences, he was not invariably felicitous in his changes. Some simply said it his way instead of your way. (As one example, I like "cut out" better than "omit" in the context of your editorial.)

I am not ready to admit that one word is always better than two. If that were the sole criterion of good writing, it would all sound alike.

It reminds me of an old vaudeville skit (is "old" redundant?) in which a telegram is reduced, step-by-step, to nothingness.

Keep up the good work!

John Meyer, M.D.
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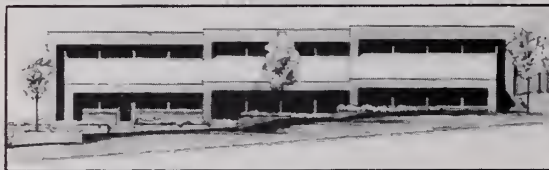
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Clear Communication With Medical Consultants Prevents Patient Injuries and Malpractice Suits

Injuries to patients and malpractice litigation can be avoided when communication between referring physicians and other medical specialists, or hospital service departments, is clear and meaningful. The specialist who is asked to consult on a case needs to know what the purpose of the consultation is and must be able to rely on the accuracy of the medical chart to assure that his diagnostic recommendations and advice for treatment are appropriate.

Suggestions for Improved Communication with Consultants

Unclear communications between referring physicians and consultants can result in inappropriate follow-up, contraindicated prescriptions, and confusion about which physician should be contacted when problems arise. Contradictory signals from several physicians treating the same patient may result in a loss of patient confidence. Some recommended guidelines for communications among physicians:

- A distinction should be made between a request for a consultation and a request to assume ongoing care of the patient.
- Consultation requests should indicate the degree of urgency.
- A telephone report is a temporary communication. The consultant should complete a written report in a timely manner. If no report is requested, the referring physician should make a note in the patient's chart of conversations with the consultant. As a rule, consultants best protect themselves from liability when they do send a written summary of their evaluation. The report avoids confusion if the patient misunderstands instructions and relays them erroneously to the referring physician.
- The consultant should indicate what information was reviewed so that the consultant's opinion is appreciated in the proper context. (The results of tests or treatment ordered by the referring physician may not have been completed at the time of the consultant's examination.)
- When a consultant alters the referring physician's written orders in the hospital,

or changes the plan of treatment for an out-patient, these actions should be mentioned in the consultation note.

- When a referring physician elects not to carry out the recommendations of a consultant, the medical chart should indicate the reasons the recommendations are not followed.

Communication With Radiologists

The radiologist is a recognized specialist in his field, and consultations with him should be handled in the same manner as contacts with other consultants. A common, but risky, practice is the failure of referring physicians to provide the radiologist with adequate clinical information. Radiologists who testify in malpractice cases often contend that the failure of referring physicians to provide adequate information increases the risk of misinterpreting an x-ray and may result in patient injuries.

Communications between referring physicians and radiologists can be improved by observing reasonable guidelines:

- Provide adequate clinical information on x-ray requisitions and include the reason for the x-rays. Single word "orders" (e.g., "skull," "chest") may be inadequate.
- Before requesting x-rays for women of child-bearing age, check the date of their last menstrual period, and note this data on the requisition. If the patient is pregnant, but the x-rays are medically indicated, a physician should tell the patient the risks and alternatives to the x-rays.
- Ask nurses to inform the radiology technician, or others who transport your hospitalized patients, if special precautions need to be taken. It may be unsafe to leave some patients alone in radiology reception areas.

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GENERAL SURGEON AND/OR OB/GYN SURGEON to join 10 doctor multi-specialty group in Owatonna, a community of 18,500 located 68 miles south of the Twin Cities and 42 west of Rochester. Present staff consists of 7 family practitioners, 2 internists, and 1 general surgeon. Other specialties in the community and a close working relationship with the Mayo Clinic, the University of Minnesota hospitals, and other metropolitan centers provide for excellent consultations. Guaranteed salary first year with incentive program thereafter. Group Health, disability, life and accident insurance, retirement profit sharing, and automobiles provided by corporation. Contact: J. D. Miller, M.D. or James Wilkus, Administrator, Owatonna Clinic, P.A., 134 Southview, Owatonna, MN 55060. Telephone (507) 451-1120.

NEUROLOGIST Board certified/eligible for 45 physician multi-specialty group in rural Minnesota with large referral area. CT Scan (GE8800) in community hospital. Large local state hospital would welcome consultations. Stimulating professional opportunities along with good family living — excellent schools — many lakes. Liberal salary and fringe benefits. Interested contact Ronald Holmgren, M.D., Willmar Medical Center, Willmar, MN 56201.

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FAMILY PRACTITIONERS — Large multi-specialty teaching group practice has openings for two physicians wishing to establish an affiliated rural practice approximately 40 miles from St. Paul/Minneapolis. Positions include opportunities for teaching and academic affiliation with the Family Practice Department of St. Paul-Ramsey Medical Center. A position is also available for a family practitioner at St. Paul-Ramsey Medical Center. This position will have emphasis on patient care, community health and teaching. Excellent salary and fringe benefit package for these positions. Interested physicians should contact C. Suwinski, Suite 9, 640 Jackson Street, St. Paul, Minnesota, 55101.

FAMILY PHYSICIAN, board eligible, to join group of six Board Certified Family Practitioners and one Board Certified General Surgeon in Blue Earth, Minnesota. \$45,000.00 plus incentive bonus first year with full membership after first year. 4,000 population with practice area of 25,000 in South Central Minnesota. Economy is stable agricultural plus small clean industries. Connected hospital and clinic enlargements now under construction. Complete ancillary support including anesthesiology, radiology, pathology, etc. Contact Marjeane Werner, Clinic Administrator or Dr. Thomas E. Watts, Business Phone: (507) 625-7371. Blue Earth Medical Center, Ltd., 520 South Galbraith, Blue Earth, MN 56013.

MEDICAL OFFICE SPACE for rent: Heart of downtown Minneapolis. Physicians in Medical Arts Building, 825 Nicollet Mall wish to sublet their facilities to another physician on a part-time basis. Call (612) 332-5316.

FOR SALE 2 Midmark 104 exam tables with warming drawer, like new, one year old, \$300 each. (612) 572-0545.

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(Continued from page 399)

OB GYN to join successful 12 physician practice in Faribault, MN, just 50 miles south of Mpls. on 35 W. 2 general surgeons, 2 internists, 8 family physicians. Busy OB practice. Newly remodeled clinic 5 blocks from modern well-equipped hospital. Guaranteed salary first year, incentive compensation thereafter. Disability, Life, Health, Malpractice insurance paid by the clinic. Profit sharing and pension plan as well as generous vacation and study time. Contact Darral Mischke, Administrator, Faribault Clinic, Ltd., 924 N.E. 1st St., Faribault, MN 55021. Telephone: 507-334-3921.

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GROWING PRACTICE NEAR TWIN CITIES . . . interviewing for a Family Practitioner. Our Board Certified five physician group practice added one Family Practitioner but is looking for second to meet the needs of growing practice at the clinic and its branch office. Glencoe, Minnesota, is an ideal community and is only 53 miles from Minneapolis/St. Paul. We welcome your interest and questions. Please contact Donald B. Rudy, M.D. or Gary VanHouse, Administrator, Glencoe Medical Clinic, P.A., 525 East 18th Street, Glencoe, Minnesota, 55336, (612) 864-3116.

INTERNIST: Board qualified or certified with subspecialty training in cardiology to join solo internist. Call or write: R. LAWRENCE THIENES, MD, BOX 1161, ST. CLOUD, MN 56301, (612) 252-7790.

STAFF PSYCHIATRIST CMHC has an excellent opportunity for a staff psychiatrist. Must be board eligible. Programs include in-patient, out-patient, education and consultation, specialized services to children, the chronically mentally ill, and the chemically dependent delivered in conjunction with a seasoned team of multi-disciplinary mental health professionals including two part-time psychiatrists. Excellent four-season recreational area. Salary and fringe benefits negotiable. Contact: Donald E. Frees, ACSW, Area Program Director, P.O. Box 646, Bemidji, MN 56601. An Equal Opportunity Employer.

LOCUM AVAILABLE. Two experienced MDs, good experience in FP/OB/ER. Call Lucky 1-612-424-5494 evenings or weekends.

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OFFICE SPACE TO SUBLET: Woman internist/endocrinologist in the Metropolitan Medical Office Building, Minneapolis, wishes to sublet office space to another physician for the purpose of sharing overhead cost and week-end and night coverage. Future partnership is possible. For details please write Minnesota Medicine (800), 2221 University Ave. SE #400, Minneapolis, Minnesota 55414.

FOR SALE Xray, 3-4 exam rooms, lab. Everything for new FP/Internist office. Quality equipment. Call Lucky 1-612-424-5494 evenings or weekends.

FAMILY PRACTITIONER WANTED To locate in medical office building in Upper Midwest university community of 115,000 people. Wide range of recreational, cultural, and educational facilities. Staff privileges available in modern 205 bed hospital associated with medical school Family Practice Residency Program. Guaranteed income and financial assistance available. Will pay travel expenses for interview. Contact Steven Bagan, M.D., 100 Fourth Street South, Fargo, North Dakota, 58103. Phone: 701-293-8242.

FAMILY PRACTITIONER — Join an active practice in Northern Minnesota. Two young F.P.'s are looking for one or two associates to replace retiring partner. Attractive clinic and 44 bed hospital in a friendly town of 2000. Contact W. Ofstedal, M.D., 218-435-1212, Fosston, Minnesota 56542.

OFFICE SPACE FOR RENT: Physician in Loring Park area of Minneapolis wishes to rent part of his office to another Doctor. Six exam rooms, x-ray, lab, proctable, etc. Adjacent to hospital. Call 612-870-8448.

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INTERNIST wanted to associate with a Northern Illinois multi-specialty group. This eight physician, fee-for-service practice is based in a thriving city of 30,000 and associated with a 250-bed community hospital. If you are interested in further details, please forward your c.v. and a letter outlining your income requirements too Minnesota Medicine (734), 2221 University Ave., S.E., Room 400, Minneapolis 55414.

INTERNIST needed in Moorhead. Metro area 100,000. 3 Colleges. First Year Salary with full partnership after one year. Contact: John Gjevre, M.D., Moorhead Medical Center, Moorhead, MN 56560 (218) 236-8555.

OCCUPATIONAL HEALTH PHYSICIAN: Excellent career opportunities in an emerging Occupational Health Department for a board certified Occupational Medicine, Family Practice, Emergency Medicine, or Internal Medicine physician. Major metropolitan medical center in the Twin Cities needs physician to provide treatment for acute work related injuries referred from a variety of employers, pre-employment exams, diagnostic assessment and evaluation, and return-to-work determinations. Three years experience in specialty field required. Comprehensive salary and benefits package. Direct inquiries and statements of work and salary history to: Clarence Harris, Director of Human Resources, Abbott-Northwestern Hospital/Sister Kenny Institute, 800 E. 28th Street, Minneapolis, MN 55407. Equal Opportunity Employer.

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GENERAL SURGEON: Tired of large city medicine? General Surgeon needed for Northern Minnesota resort area with 39 bed hospital, and drawing area of approximately 10,000. Write: Minnesota Medicine (733), 2221 University Ave., S.E., Suite 400, Minneapolis 55414.

FAMILY PHYSICIAN wanted for practice in rural Minnesota. Liberal buy in. Practice includes an office 20 miles from well-equipped modern 56 bed JCAH approved hospital. For more information, contact: James G. Lawson, Administrator, Tri-County Hospital, Inc., 418 N. Jefferson, Wadena MN 56482, call collect (218) 631-3510.

(Continued on Page 402)

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(Continued from page 401)

MEDICAL DIRECTOR, community clinic in N.E. Mpls.

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GROUP OR SOLO practice available in a northern Minnesota rural community. National forests, skiing, excellent fishing and hunting are easily accessible. Existing practice with building and equipment. Present physician averages 20-30 patients per day. Financial incentive package includes interview and relocation expenses, income guarantee, and paid CME leave and coverage. For additional information please call or write: Ernie Hawkins, Hospital Corporation of America, P.O. Box 1517, Nashville, TN 37202, 1-800-251-1537.

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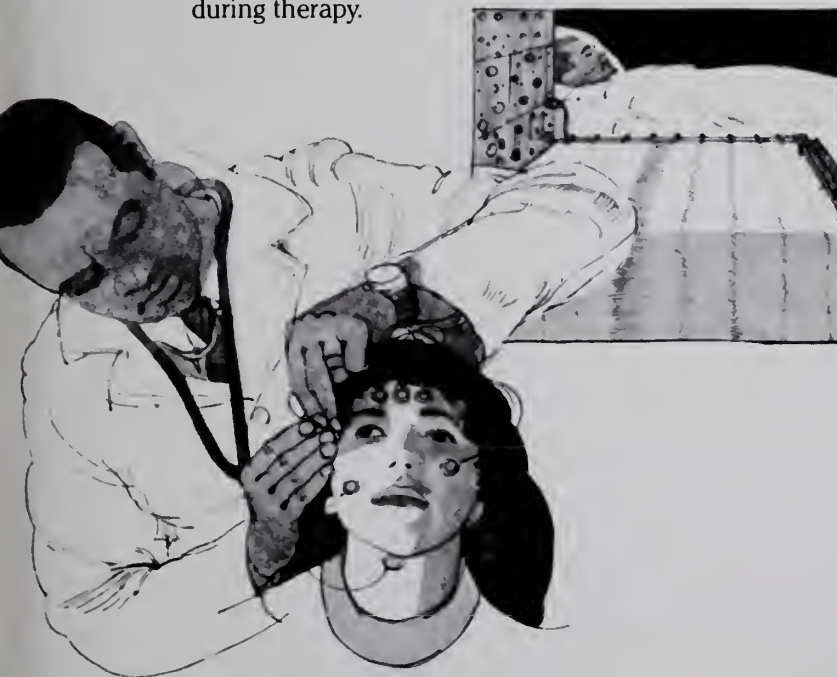
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References: 1. Kales A et al: *J Clin Pharmacol* 17:207-213, Apr 1977 and data on file, Hoffmann-La Roche Inc., Nutley, NJ. 2. Kales A: Data on file, Hoffmann-La Roche Inc., Nutley, NJ. 3. Zimmerman AM: *Curr Ther Res* 13:18-22, Jan 1971. 4. Kales A et al: *JAMA* 241:1692-1695, Apr 20, 1979. 5. Kales A, Scharf MB, Kales JD: *Science* 201:1039-1041, Sep 15, 1978. 6. Kales A et al: *Clin Pharmacol Ther* 19:576-583, May 1976. 7. Kales A, Kales JD: *Pharmacol Physicians* 4:1-6, Sep 1970. 8. Frost JD Jr, DeLucchi MR: *J Am Geriatr Soc* 27:541-546, Dec 1979. 9. Dement WC et al: *Behav Med* 5:25-31, Oct 1978. 10. Vogel GW: Data on file, Hoffmann-La Roche Inc., Nutley, NJ. 11. Karacan I, Williams RL, Smith JR: The

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Adverse Reactions: Dizziness, drowsiness, lightheadedness, staggering, ataxia and falling have occurred, particularly in elderly or debilitated patients. Severe sedation, lethargy, disorientation and coma, probably indicative of drug intolerance or overdosage, have been reported. Also reported: headache, heartburn, upset stomach, nausea, vomiting, diarrhea, constipation, GI pain, nervousness, talkativeness, apprehension, irritability, weakness, palpitations, chest pains, body and joint pains and GU complaints. There have also been rare occurrences of leukopenia, granulocytopenia, sweating, flushes, difficulty in focusing, blurred vision, burning eyes, faintness, hypotension, shortness of breath, pruritus, skin rash, dry mouth, bitter taste, excessive salivation, anorexia, euphoria, depression, slurred speech, confusion, restlessness, hallucinations, and elevated SGOT, SGPT, total and direct bilirubins, and alkaline phosphatase; and paradoxical reactions, e.g., excitement, stimulation and hyperactivity.

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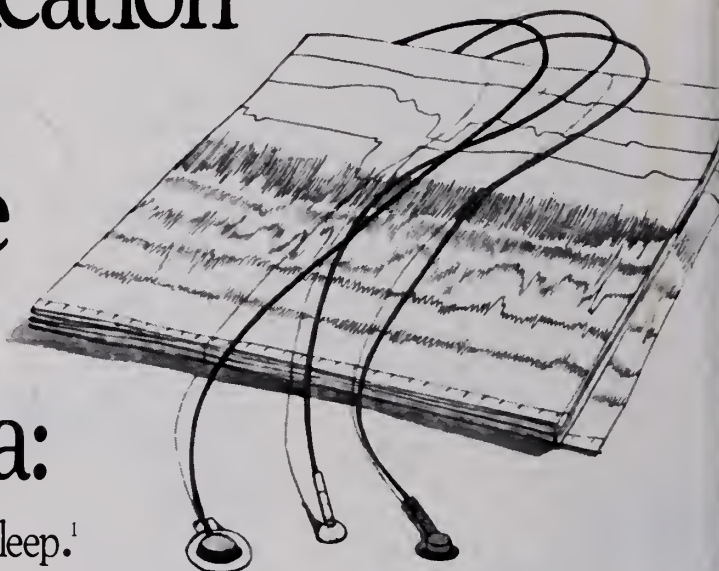
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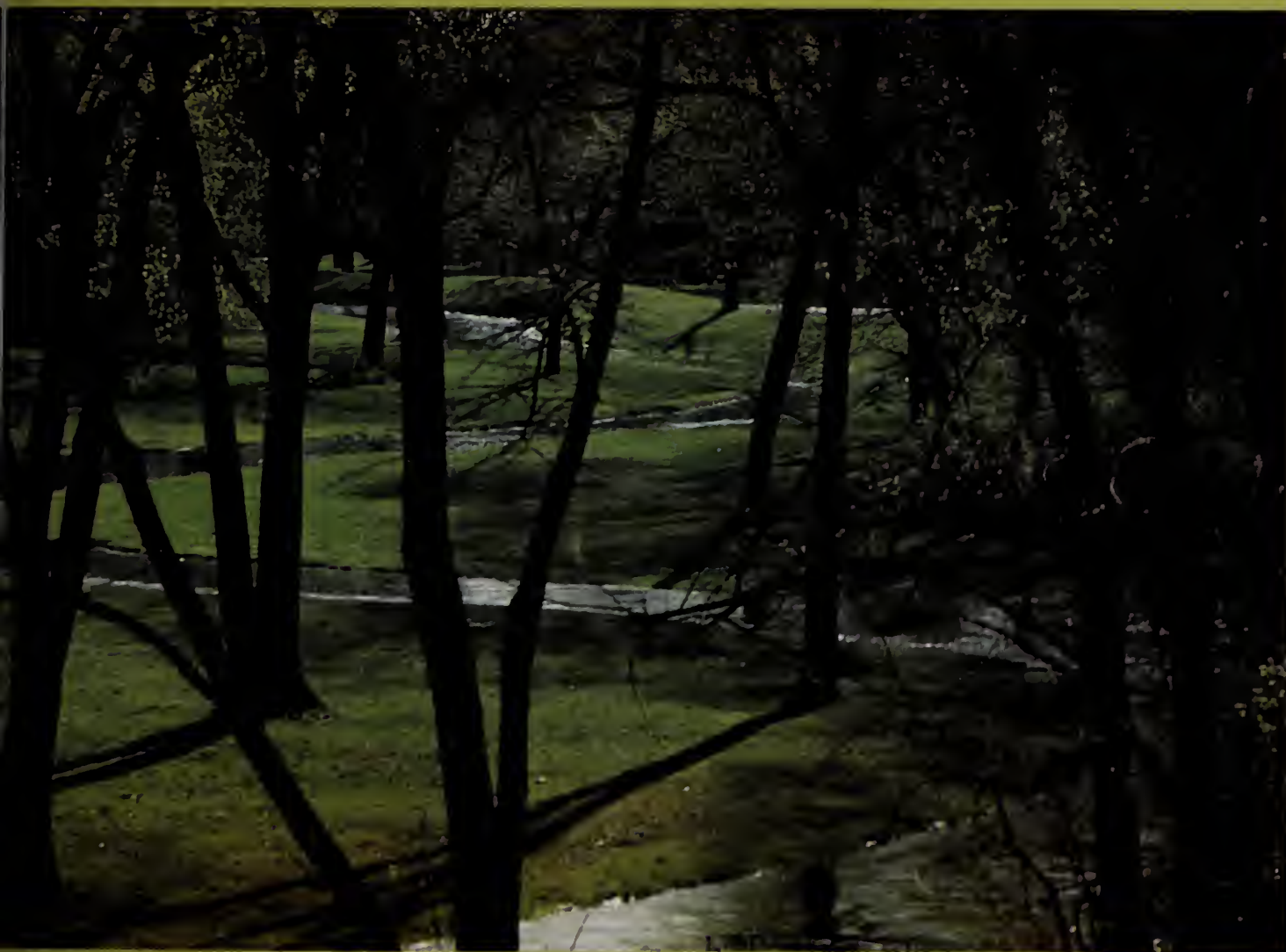
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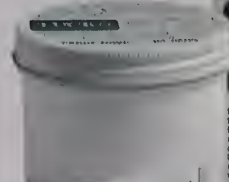
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President's Letter



On Keeping the Franchise

Unga-Po was a 27-year-old man living 35,000 years ago in a land we now call France along a river we now call the Seine. He had been enduring an abdominal pain for many days. As he lay grimacing with pain one night under his cave-bear skin cover, he decided despite his fear of the tribal priest he would ask the priest to intercede with the Great Spirit on his behalf to rid him of his affliction. He had observed that several of the priest's intercessions had been effective, causing much needed rain, bringing the mammoth herd back to the valley, etc. To his relief, the priest's application of a poultice made of mastodon dung, reindeer urine, and skunk musk, plus his mysterious incantations brought relief from the pains.

This fanciful tale will help to make a point that I believe to be of importance in our understanding of the circumstances in which we physicians find ourselves.

The central feature of the healing process involving Unga-Po was the faith he invested in the priest. The priest capitalized on this faith-relationship by wearing a weird costume designed to promote an aura of mysticism and by uttering unintelligible words in his dialogue with the Great Spirit. The technology that the priest used was non-functional, but it served to facilitate Unga-Po's ability to believe that some means of healing were being provided. Of most importance for the point I wish to make, the technology was not public property. It was the personal possession of the priest who jealously guarded the secret contents of his poultice and his incantations.

The patient's vested interest was in the person of the priest not the technology applied.

This relationship between the patient, the healer, and the technology used in the care of the sick remained unchanged from prehistoric times down through the millennia to modern times. The emotional patterns of projected faith towards the healer and a

sense of mysticism regarding his person and methods allowed for a satisfaction of dependency needs of the patient. This pattern has not changed to this day.

Rational thought played a relatively minor role in the healing process until modern times. For brief periods, the Greeks injected rational thought into health care, and the Hebrews, as revealed in the Book of Leviticus, developed some rational and effective public health policies but no effective technology arose from these periods. As recently as the American Civil War, physicians had only opiates to alter the biology of pain, purgatives to promote evacuation (but little rational application thereof), and crude surgery without anesthesia. The patient's vested interest remained in the person of the physician.

We can perhaps mark the advent of rational thought and the accumulation of knowledge and medical science with such items as Vesalius's anatomic observations and Harvey's demonstration of the circulation of blood. The point I wish to emphasize is that with the advent of scientific method, knowledge became a public possession. The truth of the circulation of the blood and the straight femur was not owned by any person or sect.

As knowledge accumulated and became useful in the diagnosis and treatment of sick people, it became the armamentarium of the people who studied it, namely physicians. It made good public policy to establish the use of this knowledge as the legal basis for medical practice. More and more with the accumulation of knowledge and technology, the patient's vested interest became focused on its availability for application to his or her individual needs and to a lesser extent on the person of the physician even though, as previously stated, the physician still plays an important role in fulfilling the patient's dependency needs. The physician remains the repository of hope for the patient.

PRESIDENT'S LETTER

To state this in different language, *the public, through historical practice and law, gave physicians the franchise to use the accumulated medical knowledge in treating the sick.* It was natural and inevitable we physicians would come to believe that we have ownership of the medical knowledge, and that only we can really understand it, and that it is ours to dispense and utilize for the benefits of our patients. Consequently, it has seemed to us it is ethically correct that corporations could not take the same knowledge and market it to the public at a profit. Also it has seemed ethically correct that no small fraction of medical knowledge could become the franchise of a group with limited medical education who would apply it to the treatment of the sick independent of physicians' supervision. We believe specialization should follow a general medical education and not exist separately from such a basic education.

We are in the process of losing this exclusive franchise. To make this point as strongly as possible it should be noted that we are not only in danger of losing it but rather the direction of recent changes in public attitudes and policy will cause us to be displaced from being the only franchise holders for dispensing health care unless such attitudes and policy are altered. The only issue, pending such a reversal of recent public policy, is the extent of our loss of

franchise.

This does not mean our cause is lost. It does mean, I believe, that any physician who fails to comprehend this fact and who chooses to remain politically inactive is the true hazard to the viability of our current system of doctor directed health care more than the physician who practices in a prepaid health plan.

We have some important strengths in our arsenal. We have a broader and deeper knowledge of medical science than any other group. We have the goodwill of countless numbers of individuals who have personally benefited from our care. We must understand, however, that there may be validity in the public's criticisms of us and how we have managed our franchise. We should continue to react to these criticisms in good faith efforts to meet these concerns. Most importantly we should recognize that franchise awarding is a *political* process. We must be willing and even anxious to tell our story and to demonstrate our effectiveness in delivering health care.

A self-righteous posture of being above the battle or even just indifference will guarantee our defeat.



Donald C. Bell, M.D.
President
Minnesota Medical Association

MMA Announces 1983 Recipients of Distinguished Service Award, President's Award

Dr. Robert O. Bergan, M.D., Duluth pediatrician, has been named the 1983 recipient of the Distinguished Service Award by the Minnesota Medical Association.

Recipients of the 1983 President's Awards were: **Malcolm M. Fifield, M.D.**, a Duluth urologist and former MMA vice-president; **Edward H. Kelly, M.D.**, a St. Paul orthopaedic surgeon and former secretary of the Minnesota Orthopedic Society; **Robert T. Petersen, M.D.**, a St. Cloud family physician and former MMA Trustee; and **Lloyd G. Bartholomew, M.D.**, a Rochester internist and AMA Delegate.

Northwestern Pediatric Society

The Northwestern Pediatric Society's annual meeting will be held at the Chanhassen Dinner Theater in Minneapolis, Minnesota on September 30, 1983. Featured speaker will be Dr. A. Levine whose topic will be "Acquired Immunodeficiency Syndrome." The morning is devoted to presentation of original papers and the afternoon to a program of sub-specialty courses.

Contact: Fredric Kleinberg, M.D. 612-373-3170.

Phormia Regina Myiasis in a Malignant Wound

ELIZABETH R. SEAQUIST,* THOMAS R. HENRY, M.D.;† EDMUND CHEONG, M.D.;†
and ATHANASIOS THEOLOGIDES, M.D., Ph.D.†

Myiasis caused by *Phormia regina* was observed in the ulcerated necrotic lesion of a patient with squamous cell carcinoma in the neck. Following larval exodus, the lesion appeared free of necrotic tissue.

MYIASIS OF a malignant wound caused by *Phormia regina* has not been previously reported in the English literature. It has been reported in wounds from chemical¹ or physical² trauma and in the middle ear after penetration of an otherwise intact tympanic membrane.³ Other species have been found in intestinal or urinary tract myiasis or in invasion of healthy skin by larvae.⁴

Case Report

A 62-year-old retired laborer had a moderately well differentiated squamous cell carcinoma in his right ear lobe diagnosed by excisional biopsy in 1965. He was initially treated with local resection. In 1975, recurrence in the neck near the ear with infiltration into the parotid gland was treated with a radical neck

dissection. The patient underwent partial resection of the mastoid process in 1978 because of tumor invasion. The margin of resection was found to contain tumor and was treated postoperatively with 5000 rads. A right-sided facial palsy and an ulcerated wound developed in the area of the previous neck dissection in 1979, and an additional 5000 rads were given. In 1980 the wound again appeared. A sinus tract was noted to connect the right external auditory canal to the ulcerated wound below the ear. Local debridement was given for palliation. Persistent drainage was empirically treated with tetracycline and occlusive dressings to the right ear and neck.

In 1980 the patient was referred to the University of Minnesota Hospitals, where his original diagnosis was confirmed by review of pathologic specimens obtained in 1965, 1975, and 1978. Treatment was begun with monthly bleomycin, cyclophosphamide, methotrexate, and 5-fluorouracil. Following chemotherapy the wound decreased in size, and the patient experienced a decrease in pain and marked subjective improvement. Persistent wound drainage was empirically treated with metronidazole and occlusive dressings to the right ear and neck.

In June 1981, in spite of compliance with instructions for meticulous wound care, the patient had the onset of an unusual and severe "boiling" pain at the wound site. A brown, foul-smelling discharge was also noted. After three days of discomfort, frank bleeding occurred, and ivory-colored maggots were observed in the wound. The patient was brought immediately to the University of Minnesota Hospitals from his northern Minnesota home.

On admission he was afebrile and markedly uncomfortable. The wound was now a 5 × 4 × 3 cm ulcerated crater filled with maggots and a small amount of serosanguinous fluid. A 2-cm sinus tract connected the wound to the right external auditory canal, which also contained maggots. The maggots were 1 to 2 cm in

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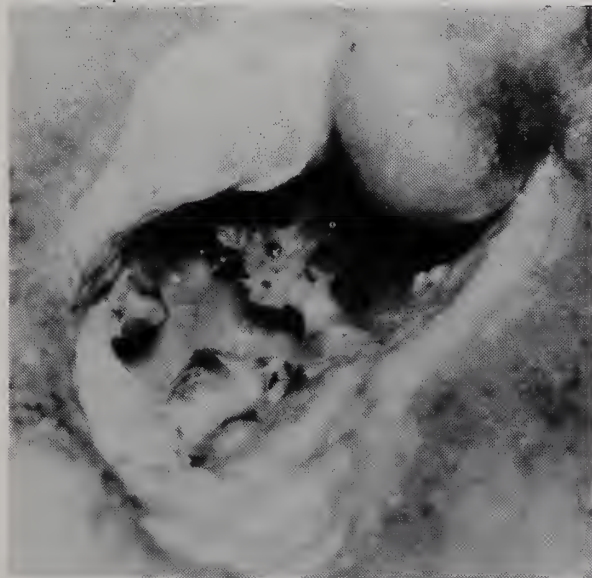


Figure — Malignant wound after larval exodus; no larvae are seen, and the wound is almost free of necrotic tissue.

length and ivory in color. The peripheral leukocyte count was 7200 with a normal differential, and the hemoglobin was 13.4.

The wound was treated with hydrogen peroxide and warm water irrigation, followed by removal of the individual maggots with a suction catheter. Over a period of three days, more than 200 maggots were removed from the wound, and the patient's pain slowly resolved. On the fourth day of hospitalization the patient awoke with maggots on his pillow and bedsheet, but none were present in the wound. No maggots appeared again. After the larval exodus, it was observed that the wound had very little necrotic tissue (Figure). Prior to the infestation the wound had large necrotic areas.

The larvae were identified as *Phormia regina* by Dr. Laurence K. Cutkomp of the Department of Entomology, Fisheries, and Wildlife at the University of Minnesota. Speciation was based on characteristic morphology of the larvae and of the adult flies into which larvae were metamorphosed.

Discussion

Phormia regina larvae rarely infest human tissue. A

review of the literature suggests the adult fly may be attracted to open, draining wounds. In 1929 Stewart reported the infestation of a foul-smelling, dermatitic scalp.¹ More recently, Ali-Kahn and Ali-Kahn² reported a case of *Phormia regina* myiasis in a suppurating hip wound. In the present case, the adult fly was probably attracted to the necrotic and draining malignant tissue present in the patient's neck, as this tissue seemed to offer a particularly good substrate for this typically saprophytic species.

It is of interest that following larval exodus the wound appeared free of necrotic tissue. In the past, *Phormia regina* larvae were used successfully in the treatment of abscesses and osteomyelitis. There was concern, however, that the species may destroy healthy tissue along with the diseased.⁵

Prevention of myiasis in patients with open, draining wounds is recommended through the continuous use of occlusive dressings. Absolute compliance is required to avoid an infestation, such as the one described. Should myiasis occur, persistent mechanical removal appears to minimize the pain and subsequent potential tissue damage that may be associated with the infestation.

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Study on Asthma/Imagery in Children

Dr. Dan Kohen is conducting a study on Asthma and Relaxation/Mental Imagery in Children. This Robert Wood Johnson Foundation-supported research project is in progress and seeking additional participants. Children in the age group 7 to 13 years with known asthma and no prior experience with relaxation/imagery (or hypnosis) are encouraged to enroll in this project. The study will compare the progress and severity of asthmatics who learn relaxation/imagery with those who do not. The study will include pulmonary function testing and personality inventories and may include (depending upon group assignment) relaxation/imagery exercises, all at no cost to the patient. Results of studies will be shared with the primary physician who will continue all pharmacologic management which will not be affected by the study protocol.

If you know of children who would benefit from and be interested in this research, please call the Project Coordinator, Janny Brust, at 874-6798 or Dr. Dan Kohen at 874-6238.

Evolution of SIDS Diagnosis

RALPH A. FRANCIOSI, M.D.*

This paper traces the historical evolution of the SIDS diagnosis. Prior to the twentieth century the term "overlying" was used to explain sudden, unexpected deaths in young infants during sleep. In the first half of the twentieth century these deaths were certified as accidental asphyxiation. Beginning in the 1950s most of these deaths were diagnosed as viral pneumonia. The SIDS terminology was established in 1969 and is a valid post mortem diagnosis.

THE QUESTION IS often asked "Is SIDS something new?" Historically, we can search for cases that are similar to SIDS either by their description or the observation that a large group of infant deaths occurred without clinical illness.^{1,2} Recorded in the Bible, 1 Kings, Chapter 3, verses 19-20, "And this woman's child died in the night; because she overlayered it. And she rose at midnight and took my son from beside me, while thine handmaiden slept, and laid it in her bosom and laid her dead child in my bosom." The term "overlying" implied that an apparently healthy infant was accidentally smothered during sleep by a mother or wet nurse. In 1893, Templeman³, a coroner in Dundee Scotland, associated overlying with maternal alcohol intoxication and argued for prosecution of mothers who overlayered their infants. One can imagine the anguish of mothers who thought they had smothered their infants and in addition had to endure the stigma of prosecution for child neglect. W. B. Yates⁴ in his poem, "The Ballard of Moll Magee" in 1906 wrote:

*"I lay upon my baby;
A little childer dear.
I looked upon my cold baby
When morn grew frosty and clear.
A weary woman sleeps so hard!
My man grew red and pale,
And gave me my money, and baid me go
To my own place, Kinsale.
He drove me out and shut the door,
And gave his curse to me;
I went away in silence
No neighbor could I see."*

Although the unexpected death of infants during

sleep was usually attributed to accidental overlying, a report by Fearon (1834)⁵ inferred these deaths might be due to natural causes. His alternative explanation for sudden infant death was enlargement of the thymus gland. Plather (1614)⁶ described the sudden death of a five month old male, who demonstrated at autopsy an enlarged thymus. He concluded that death was caused by suffocation secondary to thymic enlargement. Lee (1842)⁷ cautioned that more study was needed before thymic enlargement could be accepted as a cause of sudden death. He listed several reports stating that hypertrophy of the thymus caused suffocation in infants. Several reports went so far as to propose routine thymectomy in infancy. Paltauf (1889)⁸ postulated that in sudden deaths in infants if the thymus weighed more than 15 grams and was accompanied by enlarged lymphoid tissue, a condition labeled "status thymicolymphaticus" caused the death. Hammar (1889)⁹ showed that the thymus was heavier in persons who died suddenly compared to those dying with a chronic illness. Friedlander (1907)¹⁰ treated an infant with "thymic asthma" by irradiating the thymus. The symptoms abated and hence he proposed thymic irradiation as a therapeutic modality for infants with "thymic asthma". In the 1920s the practice of routine irradiation of the thymus in a foundling home in Chicago prior to an infant's placement for adoption, was used as a preventive measure against sudden death. Boyd (1927)¹¹ in a thorough post mortem study, clearly demonstrated that the condition "status thymicolymphaticus" was not a cause of sudden infant death. Indeed, her study indicated that the thymus was of normal weight in these infants compared to smaller thymic weights in hospitalized infants who were autopsied. The status lymphaticus investigation committee organized by the Medical Research Council in conjunction with the Pathological Society

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of Great Britain and Ireland confirmed her observations.¹²

In 1936 Gafafer¹³ reported that accidental mechanical suffocation was the leading cause of death for infants under one year of age. In 1944 Abramson¹⁴ reported that the number of infant deaths in New York City from suffocation was larger than the combined deaths caused by measles, scarlet fever, and diphtheria. Wooley (1945)¹⁵ questioned whether the diagnosis of infant suffocation was accurate. He stated, "There is no doubt as to the seriousness of the problem, but we wonder whether emphasis is being placed at the right points; a distressingly large number of babies die without noticeable predisposing cause, but is the primary premise correct, that all reported as having suffocated have actually died from simple occlusion of air passages by bedding, sleeping attire or other mechanical means?" He was instrumental in suggesting that "physiologic dysfunction while less clearly definable than the preceding categories is one where speculation might prove most fruitful. The rapid growth so characteristic of the early months, results in constant change of physiologic relationships and in gross instabilities." Werne and Garrow (1947)¹⁶ reported that "the proper approach to this problem, however, requires that failure to find a cause of death be readily admitted and honestly recorded; and not concealed under such listings of our mortality tables as accidental, mechanical suffocation and status thymicolymphaticus." They proposed, "it is further suggested that the American Public Health Association appoint a commission of pediatricians, pathologists and health officers for the comprehensive study of this important problem of sudden death during infancy." Werne and Garrow pursued their studies and reported in 1950¹⁷ the presence of microscopic respiratory disease with widespread vascular injury in all cases of sudden unexplained death. They postulated that the etiology was related to fulminant infection, probably non-bacterial.

Bowden (1950)¹⁸ reported that many infants who died unexpectedly had histopathological lesions suggesting acute infection rather than accidental suffocation as the cause.

Bowden and French (1951)¹⁹ studied forty-three unexpected deaths in infants, many of whom the cause of death was supposed suffocation in bed. They noted that many cases after careful inquiry had a mild respiratory infection at the time of death. Histological studies showed evidence of respiratory tract infection.

Werne and Garrow, in their report in 1953²⁰, noted that 16.8% of sudden and unexpected infant deaths had an explainable cause at post mortem examination,

e.g. congenital heart disease. They also noted that in 80.6% of the unexplained infant deaths, there were intrathoracic petechiae involving the thymus and/or pleura and/or pericardium. All these infants had diffuse bilateral pulmonary congestion and edema. In addition, they noted that each case microscopically had some evidence of inflammatory changes in the upper and/or lower respiratory tracts. They concluded that these unexpected and unexplained deaths were most likely natural due to fulminating respiratory disease.

Barrett (1954)²¹ reported on sudden deaths in infancy in England and Wales. He concluded that these deaths, referred to as "cot deaths", comprised about one third of all cases of unexpected death in infancy. His opinion was that only a small number of cot deaths are due to fulminant infection caused by a familiar organism such as *Streptococci*. He proposed that inhalation of milk in stomach contents should be investigated as the cause of death. He postulated that the death might not be purely asphyxial secondary to aspiration of gastric content and interference with oxygen inflow, but rather related to the absorption of milk derivatives into the blood stream resulting in shock.

Adelson and Kinney (1956)²² studied 126 consecutive cases of sudden and unexpected death in infancy. They noted microscopic inflammation in one or more sites of the respiratory tract in 84% of the cases. Their study indicated that no evidence was apparent that disease of the thymus, lymph nodes or spleen caused or contributed to the sudden and unexpected death. There was not anatomic evidence that suffocation had occurred based on objective findings of mechanical asphyxia or reliable detailed history. They concluded that the actual lethal process remains unknown, however mechanical asphyxiation by bedclothes was not a serious consideration.

Beckwith (1969)²³ defined SIDS as the "sudden death of any infant or young child, which is unexpected by history, and in which a thorough post mortem examination fails to demonstrate an adequate cause for death." He noted that "anyone who has examined even a small series of such cases will be impressed by the similarities in clinical setting and in the post mortem findings in the vast majority of SIDS cases thus defined, and most workers soon come to the conclusion that SIDS is, with rather uncommon exceptions, a diagnosis that can be made with considerable certainty on the basis of positive findings."²⁴ Froggatt and colleagues²⁵, in a scholarly epidemiological study of cot death (SIDS), wrote: "The characteristic age range is the most important

EVOLUTION OF SIDS DIAGNOSIS — FRANCIOSI

factor and there seems little doubt that these infants die because, while passing through this period of increased physiological vulnerability, some critical combination of intrinsic and extrinsic factors proves lethal: what is in doubt is the mechanism, or final common pathway of death.”

At present SIDS is accepted as a valid post mortem

diagnosis. The mechanism of death is unexplained but natural and is age and sleep state dependent. The accuracy of SIDS diagnosis relies on the diagnostic acumen of the pathologist and his access to clinical history, circumstances of death and post mortem examination on each case.

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In order to select the best cover pictures for MINNESOTA MEDICINE the cover editor requests that all amateur photographers search slide collections and submit more pictures. The appreciation of beauty is always quite subjective, whereas the selector might find a different picture desirable for the cover. Such factors as the background, the amount of lighting, and the presence of extraneous background images on the slide may make a cover selection less desirable. It is suggested that several of your better pictures be submitted for consideration in the hopes that one might be chosen. Currently the cover editor is in need of photographs starting with next November's edition which would include late fall and winter scenes. It is requested that vertically positioned slides be submitted at this time in order to try a changed cover format.

Bruce Nydahl, M.D.
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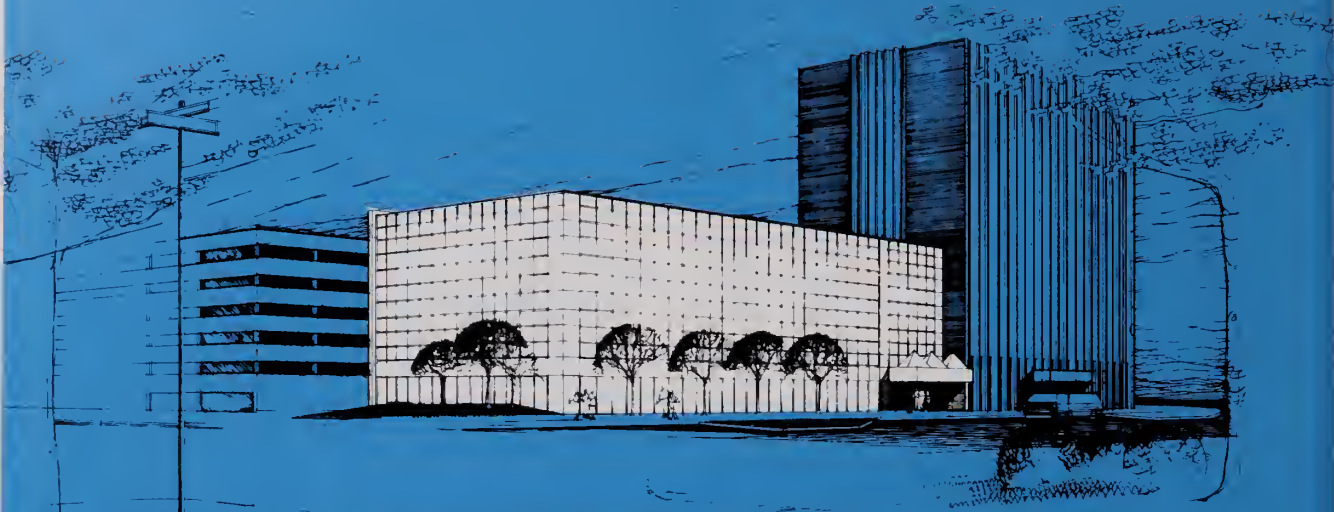
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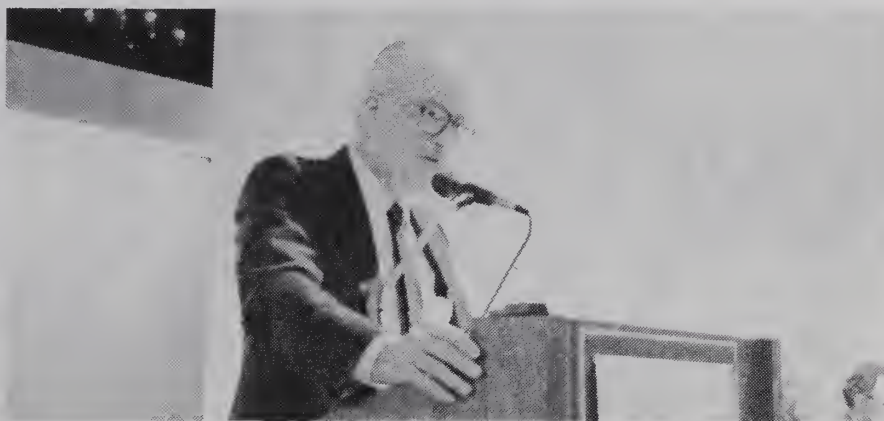
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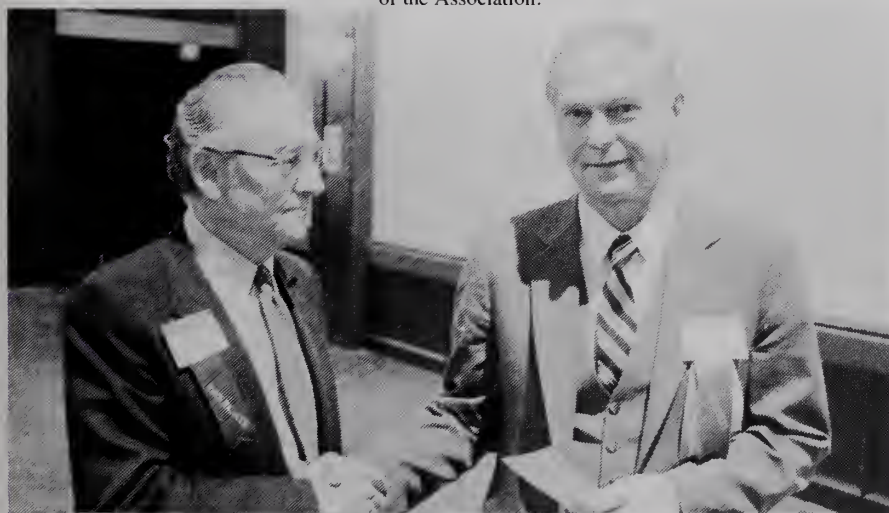
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May 18-20, 1983



Winners of the Award for the best manuscript published in MINNESOTA MEDICINE in 1982 are from left to right, R. J. Fencel, M.D., Richard L. Reece, M.D., Editor-in-Chief, C. J. Godec, M.D. and Henry Bates, Ph.D. Dr. A.S. Cass, the fourth author, is not shown. The award was given during the Annual Meeting of the Minnesota Medical Association. (Photographs by Roger K. Johnson)



Donald C. Bell, M.D., newly elected president of the Minnesota Medical Association, giving his presidential address before the House of Delegates during the Annual Meeting of the Association.



James Mankey, M.D., president of the Hennepin County Medical Society's Philanthropic Foundation, presented Severin H. Koop, M.D., president of the Minnesota Medical Association, with a check for \$5,000 for the MMA Student Loan Fund.

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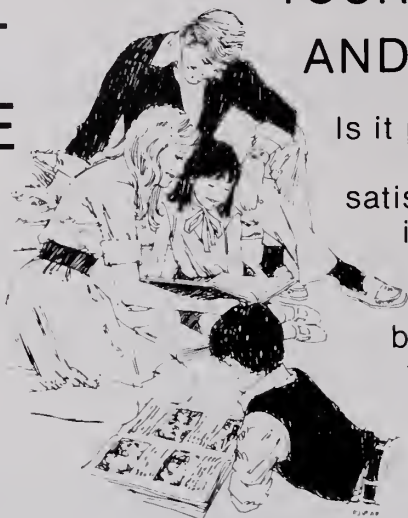


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Letters to the Editor

Dear Editor:

I would like to comment on the article by Drs. Thomas Christiansen and Kent Wilson in the January 1983 issue of *MINNESOTA MEDICINE*.^{*} The article was in regard to the use of protective eye wear in the various racquet sports.

The picture shown was that of an open eye guard, which has been shown to be ineffective in completely protecting the eye from ocular injuries. The open eye guard does not protect the eye completely because of the size and flexibility of the squash and racquet balls. If you combine this with the velocity at which the balls can strike the individual, the open eye guard is less than adequate for total protection to the eye and lids. Studies have shown that the ball can easily be compressed through the open eye guard, resulting in eye injuries such as hyphema, iritis and corneal abrasions.^{1,2}

It is far safer to use a complete eye protection, such as safety glasses with an appropriate frame, either of hard rubber or of the new polycarbonate material. The full protection across the eyes prevents the ball from molding between the rims, as could happen with the open eye guard. The complete mask, wire or plastic, is probably the optimal type of protection for the face in these racquet sports, but many people find it cumbersome and difficult to wear.

I believe the open eye guard should be strongly discouraged from use at this point because of the false sense of security people may have in wearing it.

Aaron L. Nathenson, M.D.
Minneapolis, Minnesota

^{*}Page 29

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1. Easterbrook, Michael: Eye Injuries in Squash and Racquetball Players: An Update. *The Physicians and Sports Medicine*, 10:3, March 1982
2. Bishop, Patrick: Performance of Eye Protectors for Squash and Racquetball. *The Physicians and Sports Medicine*, 10:3, March 1982

Dear Editor:

We agree with Dr. Aaron Nathenson's comments concerning improved protection of the eye in racquet sports if a non-fenestrated eye guard is worn. Our January 1983 article in *Minnesota Medicine* is a reprint of an article written in 1980 and published early in 1981, and the illustrations were not selected by the authors. As Dr. Nathenson's references suggest, however, the inadequacy of an open eye guard is a recent concept.

Hopefully Dr. Nathenson's concern will be appreciated and stimulate greater use of more thoroughly protective eye wear.

Thomas A. Christiansen, M.D.
Kent S. Wilson, M.D.
St. Paul, Minnesota

LETTERS TO THE EDITOR

Dear Dr. Reese:

As an editor of non-clinical articles that are usually edited by other editors, I couldn't resist rewriting your 28 Rules of Readability. In fact, I've boiled them down to 14, including a few of my own to boot. Which perhaps goes to show that even good rewriting can be improved upon, and that there are as many ways to say something as there are people.

Mark Holoweiko
Dumont, New Jersey

P.S. I work for *Medical Economics*, and read your editorials regularly, with great pleasure.

1. Before writing anything for publication, consider whether it's worth your time and the reader's. Also ask yourself, "Should a tree give its life for this?"
2. If so, settle on a logical organization for the material.
3. Write conversationally, not condescendingly; thou shalt not preach. And contractions aren't sins.
4. Be concise, yet precise, use short words, sentences, and paragraphs frequently.
5. Favor the active rather than passive voice; the strong verb, adjective, and adverb over the weak.
6. Avoid clichés, specialized gobbledegook, unfamiliar terms, and the like.
7. Never, but never, be redundant.
8. Back up your statements with specific examples.
9. Develop rhythm by varying sentence length and type, asking an occasional rhetorical question, or even throwing in sentence fragments. Get the picture?
10. Insert subheads if they'd help readers follow your train of thought.
11. Cover the subject, but don't overstate your case.
12. Revise and condense your first draft with the above in mind.
13. Ask colleagues to objectively criticize your second draft; refrain from bleeding when they do.
14. Revise again, remembering that those who aspire to leadership roles don't slavishly follow rules.

Biosynthetic Human Insulin Study

Eli Lilly and Company is sponsoring a two-year study of Biosynthetic Human Insulin (BHI) at the St. Louis Park Medical Center, Minneapolis, MN. Donnell Etzwiler, M.D. is the Principal Investigator.

The double-blind study will furnish further data on the efficacy of BHI which recently was approved by the FDA.

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Physicians interested in enrolling patients in the study may obtain further information by contacting Dr. Etzwiler or LeAnn McNeil, R.N., M.S., Project Director, at (612) 927-3393.

Development of the Term "Senility" as a Medical Diagnosis

BURTON P. HALPERT, Ph.D.*

The historical development of the term "senility" as a medical diagnosis is traced from the early Greeks and Romans to the 20th Century. Its existence is shown to be predicated upon three factors: (1) the traditional view of old age as disease, (2) medical science's inability to distinguish between normal and abnormal mental states in old age, and (3) medicine's emphasis upon use of the vernacular.

THE AUTHOR explores this historical development of the term "senility" as a medical diagnosis for cognitive and behavioral aberrations in old age. It is only recently that this label has been called into question. In 1975, Robert Butler, later the head of the National Institute of Aging, complained that physicians and psychiatrists were applying the diagnosis of "senility" to anyone over the age of 60 who showed minimal symptoms of memory or forgetfulness, difficulty in attention and concentration, decline in general intellectual grasp and ability, and reduction in emotional responsiveness to others. To Butler, "senility" constituted a wastebasket diagnosis which precludes careful diagnostic assessment and engenders therapeutic nihilism.

Support for Butler's contention can be found in the research of Duckworth and Ross (1975) which showed that the diagnosis of "senility" was used 50 per cent more often in New York City than in Toronto, Canada and London, England. Support also can be found in 1976 statistics from the National Institute of Mental Health which showed "senility" as the most common diagnosis (49.2 per cent) for newly institutionalized and institutionalized elderly in state and county mental hospitals.

The question addressed in this paper is "How did the term "senility" which was used originally as designation for the final period in the life cycle, commonly called "old age", come to its contemporary meaning and use?" In tracing the historical development of the term, it will be shown that the seeds for the present definition and use of senility were sown twenty-six hundred years ago. Beginning with the writings of Pythagoras in 650 B.C. and concluding with Galen's conception of old age as disease in 200 A.D., the early Greeks and Romans

left a legacy of meanings associated with mental dysfunctioning in old age which was to be given medical and scientific legitimacy through the term "senility" in 19th and 20th Centuries. Further, two significant occurrences during the 1800s solidified the use of "senility" as a medical diagnosis: (1) the emphasis upon use of the vernacular to designate mental disorders, and (2) medical science's inability to distinguish between normal and abnormal mental states in old age.

The History of the Term "Senility"

Early Greek and Roman Period

The story of "senility" begins with Pythagoras's (650 B.C.) division of the life cycle into five climacteric epochs: at the ages of 7, 21, 49, 63 and 81 (Day, 1849). Using the term "old age" to designate the last two periods in the life span, Pythagoras described old age as the period when the human body is in a state of decline and decay. Also in this period, mental dysfunctioning begins to regress to a much earlier state, when, according to Pythagoras:

"The scene of mortal existence closes, after a great length of time, to which very fortunately few of the human species arrives. The system returns to the imbecility of the first epoch of the infancy (Jameson, 1811:129-130)."

Two centuries later, Hippocrates gave medical legitimacy to Pythagoras's division of the life cycle into separate stages by including in his own classification of mental diseases the term "paranoia" to represent the deterioration process mental faculties suffer when in the state of old age. In specifying separate diseases for old age, Hippocrates explained that "paranoia" (what Pythagoras had called "imbecility") had an organic etiology and a fatal prognosis since "old age" was a time when the veins were

*Assistant Professor, Center on Aging studies and Department of Sociology, University of Missouri, Kansas City, Kansas City, Missouri.

empty, and the blood scanty, thin and watery (Adams, 1939).

Both Plato and Aristotle described the inevitability of mental failure in old age in their writings. Plato wrote,

"... old men more than any other must beware, both because they are ordinarily more subject to fear, taking offense and waywardness, because of their cold distemperature and also because of the weakness of the brain (Laurentius, 1599:191)."

And Aristotle stated, old people suffer from bad memories because they are in process of rapid decay. They are useless for high administrative posts since,

"... there is not much left of the acumen of the mind which helped them in their youth, nor of the faculties which served the intellect, and which some call judgment, imagination, power of reasoning and memory. They see them gradually blunted by deterioration and see that they can hardly fulfill their function (Paleotti, 1595:770)."

Whereas Pythagoras, Hippocrates, Plato and Aristotle described mental deterioration as inevitable in old age, Cicero (44 B.C.), the Roman philosopher, took a more enlightened approach by attributing this problem to the character of the person. According to Cicero, mental failure in old age can be prevented as long as men apply their mental faculties. Furthermore, he disputed Aristotle's contention that older people suffer loss of memory: "The aged remember everything that interests them (Cicero, 1923:29)."

It was in Cicero's discourse on old age that the term "senile" was first introduced into the human vocabulary.

"... *senile debility (sic esta senilis stultitia), usually called dotage, madness or delirium (quae deliratio appellatur solet), is a characteristic, not of all old men, but only of those who are weak in mind and will (senium levium est) (Cicero, 1923:45).*"

While Cicero used the term "senile" as an adjective to specify the life cycle period in which this type of mental disorder occurred, subsequent medical writers, especially during the 19th and 20th Centuries, used the term by itself as a noun to designate mental deterioration in old age. This change came about primarily because of Galen and his influence on medical thought for the next 16 centuries.

Galen (150-200 A.D.), a Roman physician, had as his major goal to bring together in one compendium the medical knowledge of past and present writers. Reflecting upon what had been written on old age,

Galen noted,

"*Old age is not natural in the same way that feeding and growing are; the latter two can be considered as natural processes, while the former is not, being instead an inevitable infection of the body (Theophrastus, 1971:373).*"

Drawing upon medical work dating from Hippocrates, he called old age a natural distemper where mental deterioration is inevitable because of the "... rarefaction and diminution in quantity of the animal spirits and from the coldness and humidity of the brain (Zilboorg, 1941:91)."

After Galen, physicians were not allowed to speak with authority on the subject of mental functioning. For 1600 years theology held sway over thinking about mental aberrations in old age. Old people showing signs of mental deterioration were accused of witchcraft and sorcery and burned at the stake (Sprenger and Kramer, 1489). During this time the term "senility" became widely used in the medical literature as a designation for the last period in the life cycle, "old age". Galenic thought prevailed, with old age being viewed as a diseased state (Hoffman, 1695, 1731).

19th Century

The 19th Century saw medicine make the final break from the speculative realms of theology and philosophy. Disorders of the mind were seriously studied, systematically classified and therapeutically dealt with (Zilboorg, 1941). This movement was begun in France by Philippe Pinel (1806) and spread to England and America. The insane were unchained and saved, disorders were divided by cause, organic and moral; but, the status of the old was left unchanged. In France, Pinel (1806), the father of modern psychiatry, influenced by the classification systems of Francois de Sauvages (1706-1767) and William Cullen (1710-1790), and Galenic thought, argued that mental dysfunctioning in old age was organically based, incurable and fatal. Describing this dysfunctioning as the slow and progressive enfeeblement of intellectual and moral faculties, Pinel gave it the Latin name "senile dementia".

Several points are noteworthy here. First, Pinel never bothered to systematically investigate this degenerative process (Charcot, 1881), yet he spoke of its inevitability in old age because of the traditional conception of old age as a disease process. This was the reason for his attaching the term "senile" to the term "dementia". And second, whereas Pinel, as a physician, was enamored with the use of Latin in

classifying mental disorders in order to give them medical credibility, subsequent writers in England and the United States advocated the use of the vernacular. These medical authors, e.g. Benjamin Rush (1812) in America and George Man Burrows (1828) and James Cowles Prichard (1837) in England, preferred the English terms "fatuity", "dotage" or "incoherence" to Pinel's "senile dementia".

Their argument was that people would better understand such disorders if the vernacular were used in place of Latin. It should be recognized, however, that these prime movers for the use of English held the same interpretation concerning mental deterioration in old age as did Pinel. Consequently, with this movement, the stage was set for the emergence of the term "senility" as a medical diagnosis.

This came about because researchers were finding it impossible to distinguish between normal and abnormal mental states in old age. As early as 1811, Thomas Jameson, an English physician, pointed out that eminent teachers of anatomy in London never demonstrated on brains of old subjects because of their more flaccid and infirm state. Quoting these teachers, he wrote, "The truth seems to be, that the brain is so frequently diseased in old age, and therefore so often soft and loaded with serum, that it is extremely difficult to discover the natural state of its structure in the late period (Jameson, 1811:136)."

Not having valid parameters by which to determine the onset of disease in old age, physicians were taught that age itself should be used as "the" criterion. Two medical academicians, J. R. Jacquelin-Dubuisson (1816) in France and Anthony Carlisle (1817) in England, told their students that it was natural for man to lose his intellectual powers at the senile epoch (age 60) when the first serious aberrations from health could be observed. And, one of Germany's foremost professors of medicine, Carl Canstatt, gave scientific legitimacy to the traditional notion of "old age as disease", when he wrote,

"One of the most weighty predispositions to disease is old age, which, however, must be looked upon as much as a condition for the predisposition to disease as a cause itself of disease. The organic changes and the anomalies of function can no longer be regarded as foreign to, but as an essential condition of the senile organism. The process of change becomes a morbid process referred to as 'senile involution' (Seidel, 1890:631)."

Throughout the 19th Century medical writers spoke of the extreme difficulty of diagnosing and treating

old people because of indistinguishability between health and morbid states in old age (Day, 1849; Maclachlan, 1863; Charcot, 1881; Seidel, 1890). "Old age" became a frequent medical designation for morbidity (Day, 1849). Physicians were advised that the good faith and usefulness of the medical profession would be compromised if they were to intervene in the natural downward trend of old age (Holland, 1857). Old people were told by their physicians, "What can't be cured must be endured (Maclachlan, 1863: IV)," and institutionalization was advocated as the only answer to "senile dementia" (Tuke, 1892). The normal mortality of advanced life increased considerably as a consequence (Seidel, 1890).

It was as the result of this medical climate that the term "senility" was introduced into medical lexicon as a diagnostic label. With medicine's acceptance that the entire period of old age constitutes a morbid process and that deterioration of the brain begins with the onset of old age, medical writers in England and America searched for a simple, comprehensible, vernacular term which would characterize this degenerative process and which would have medical legitimacy. "Senile dementia" the Latin term and "fatuity" and "dotage" its English counterparts were already in medical use to characterize the final state towards which the deterioration process of old age leads.

These authors did not have far to go in their search. For centuries, medical writers had used the term "senility" to designate the entire period of old age. Now that 19th Century medicine had legitimated the traditional notion of old age as a morbid process, the term became the most likely candidate for use as a diagnostic category for this pathological state. It was simple to understand; it was medically acceptable because of its past history; and it was representative of the vernacular.

By the 7th decade of the 19th Century, the diagnosis of "senility" began to be associated exclusively with mental deterioration in old age. Medical dictionaries referred to it as characterizing cases of senile delirium and dotage. And in 1880 and 1887, two noted English nosographers, Henry Maudsley and John Milner Fothergill, introduced "senility" as a diagnostic category in their nomenclatures of mental diseases. To them, "senility" represented the entire degenerative process of mental faculties which ultimately led to fatuity and dotage.

20th Century

At the close of the 19th Century, and during the early years of the 20th Century, Emile Kraepelin

(1915), Germany's eminent psychiatrist and nosographer, put the final touches on the use of "senility" as a diagnostic label. Furthermore, the evidence suggests that it was his writing on the subject which set the tone for its overuse during the 20th Century. He wrote that it is almost impossible to separate normal and abnormal mental states in old age; it is most difficult to distinguish between different types of mental disorders during this period in the life cycle and that even cases of simple senile deterioration, e.g. forgetfulness, should be considered as "the" prelude to senile dementia (Kraepelin, 1915).

For the next seventy years, through the 7th decade of the 20th Century, Kraepelin's inclusion of simple senile deterioration in his nomenclature of mental diseases, was to influence medical and psychiatric thought. As early as 1914 and as late as 1975, medical writers took issue with Kraepelin's perspective. Isaac Nascher in 1914 and Malford Thewlis in 1919, two of America's earliest Geriatricians, felt that because of Kraepelin's stance on the subject the diagnosis of senile debility and senility was being used too often to the detriment of older people. Robert Butler (1975), as mentioned earlier, argued very strongly against viewing simple senile deterioration as symptomatic of mental disease in old age and using the diagnosis of senility to refer to this state. Yet the official nomenclature of the American Psychiatric Association, Diagnostic and Statistical Manuals I, II, and III, for the years 1952, 1968 and 1980, continued and continues to include the Kraepelin view. In so doing, it provides support for the existence of senility as a valid diagnosis.

Several other factors have fueled the persistence of "senility" during the 20th Century. First, medicine is still attempting to discover valid criteria for determining normal and abnormal mental states in old age (National Institute on Aging, 1980). Second, the traditional notion of old age as a morbid process appears still to survive within medical thought (American Medical Association, 1959; Butler, 1975).

And third, the World Health Organization's definition of health seems to guarantee senility's future. According to this definition, health is "a state of complete physical, mental and social well-being, and not merely the absence of disease and infirmity." Such a definition leaves no room for the concept of health in old age. One needs to recognize, as Nascher (1914) stated some fifty years before, that old age as a state of development in the life of the human being represents inevitable movements away from the perfect state. These movements are normal for old age. From the perspective of the World Health Organization, it would appear that such changes are abnormal and pathological.

Finally, it should be pointed out that little difference exists between the WHO's emphasis upon a complete and perfect state in its idea of health and the early Greek's value for youth, beauty and perfection.

Conclusion

The tracing of the origin and development of the term "senility" as a medical diagnosis has given evidence to how science functions in a Kuhnian sense. Paraphrasing what Thomas Kuhn (1963), the noted philosopher of science, had to say about scientific thought: no one person nor no one period can be attributed with the distinction of having originated the term in its present definition and usage. The contemporary meaning and use of "senility" is predicated upon a paradigm, cumulative in nature, which first appeared in the works of the early Greeks and Romans. Building upon the writings of Pythagoras, Hippocrates, Plato, Aristotle and Galen, medical science has contributed in each century, including the present, to the scientific paradigm that "old age is disease". The very existence of the term "senility" in medical lexicon is sufficient evidence that the paradigm is alive and well in the 20th Century. And such will continue to be the case until medical science is capable of distinguishing between normal and abnormal states in old age.

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- 18-31. Will be found on page 455.

In Memoriam

January 1, 1982-December 31, 1982

Alvin G. Athens, Bloomington
Born 1887 — Died June 20, 1982

Reynold A. Jensen, St. Cloud
Born 1903 — Died May 29, 1982

Karl W. Pleissner, Edina
Born 1915 — Died December 10, 1982

Henry E. Bakkila, Duluth
Born 1901 — Died December 27, 1982

Conrad I. Karleen, Edina
Born 1904 — Died December 1, 1982

John F. M. Pohl, Minneapolis
Born 1903 — Died March 3, 1982

Clarence V. Bateman, Fergus Falls
1896 — Died May 21, 1982

Edwin A. Kilbride, Worthington
Born 1899 — Died August 3, 1982

Charles W. Rogers, Winona
Born 1903 — Died May 7, 1982

Harry Billings, Red Wing
Born 1925 — Died September 16, 1982

Nathaniel L. Leven, St. Paul
Born 1902 — Died August 6, 1982

Abraham B. Rosenfield, Minneapolis
Born 1897 — Died May 11, 1982

Joseph Bloom, Boca Raton, FL
Born 1906 — Died July 1, 1982

Kay R. Lundberg, Duluth
Born 1939 — Died March 7, 1982

John J. Rynasiewicz, Minneapolis
Born 1950 — Died August 18, 1982

Robert P. Buckley, Duluth
Born 1902 — Died October 16, 1982

Donald C. MacKinnon, Naples, FL
Born 1905 — Died May 9, 1982

Westley G. Schaefer, Minneapolis
Born 1897 — Died May 22, 1982

Byron S. Cochrane, St. Paul
Born 1910 — Died July 21, 1982

Arthur H. McFarland, W. Des Moines, IA
Born 1891 — Died June 8, 1982

Terry C. Shackelford, Minneapolis
Born 1937 — Died July 6, 1982

Lloyd T. Davis, Wadena
Born 1890 — Died February 16, 1982

Burtis J. Mears, Mendota Heights
Born 1908 — Died November 12, 1982

John J. Smyth, Lester Prairie
Born 1918 — Died November 12, 1982

Gilbert L. Doxey, Minneapolis
Born 1879 — Died March 2, 1982

Herbert A. Molander, Maplewood
Born 1893 — Died December 3, 1982

Carleton S. Strathern, St. Peter
Born 1908 — Died July 21, 1982

Don H. Fisher, Edina
Born 1923 — Died June 10, 1982

Hamilton Montgomery, Rochester
Born 1898 — Died June 26, 1982

Charles F. Stroebel, Rochester
Born 1909 — Died December 13, 1982

George Friedell, Minneapolis
Born 1898 — Died July 23, 1982

Wallace I. Nelson, Minneapolis
Born 1902 — Died May 9, 1982

William A. Swedberg, Duluth
Born 1909 — Died March 5, 1982

Margaret M. Galligan, Minneapolis
Born 1909 — Died May 17, 1983

David D. Norman, Grey Cloud Island
Born 1920 — Died September 26, 1982

Arnold O. Swenson, Ft. Myers, FL
Born 1899 — Died August 2, 1982

David Gavisser, Minneapolis
Born 1911 — Died June 10, 1982

Warner Ogden, Minneapolis
Born 1894 — Died October 18, 1982

Rodney F. Sturley, St. Paul
Born 1914 — Died March 15, 1982

Pierre J. Guilfoiles, Delano
Born 1907 — Died October 13, 1982

Carl J. Olson, Roseville
Born 1913 — Died November 5, 1982

Robert B. Tweedy, Winona
Born 1906 — Died October 2, 1982

Arnold L. Hamel, Minneapolis
Born 1928 — Died February 18, 1982

Richard T. Olson, Virginia
Born 1935 — Died December 31, 1982

Wilford F. Widen, Minneapolis
Born 1895 — Died September 27, 1982

William C. Harrison, Minneapolis
Born 1908 — Died June 24, 1982

Anastase Pangalos, St. Paul
Born 1930 — Died May 22, 1982

George E. Williams, St. Paul
Born 1920 — Died March 31, 1982

Earl C. Henrikson, Minneapolis
Born 1903 — Died August 30, 1982

Paul R. Pedersen, Long Lake
Born 1941 — Died April 26, 1982

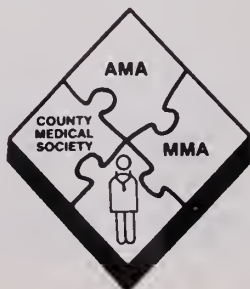
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Born 1895 — Died September 27, 1982

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References

1. Stone PH, Turin ZG, Muller JE. Efficacy of nifedipine therapy for refractory angina pectoris. *Am Heart J* 104:672-681, September 1982
2. Antman E, Muller J, Goldberg S, et al. Nifedipine therapy for coronary artery spasm. Experience in 127 patients. *N Engl J Med* 302:1269-1273, June 5, 1980

BRIEF SUMMARY

PROCARDIA* (nifedipine) CAPSULES

For Oral Use

INDICATIONS AND USAGE: I. Vasospastic Angina: PROCARDIA (nifedipine) is indicated for the management of vasospastic angina confirmed by any of the following criteria: 1) classical pattern of angina at rest accompanied by ST segment elevation, 2) angina or coronary artery spasm provoked by ergonovine, or 3) angiographically demonstrated coronary artery spasm. In those patients who have had angiography, the presence of significant fixed obstructive disease is not incompatible with the diagnosis of vasospastic angina, provided that the above criteria are satisfied. PROCARDIA may also be used where the clinical presentation suggests a possible vasospastic component but where vasospasm has not been confirmed, e.g., where pain has a variable threshold on exertion or in unstable angina where electrocardiographic findings are compatible with intermittent vasospasm, or when angina is refractory to nitrates and/or adequate doses of beta blockers.

II. Chronic Stable Angina (Classical Effort-Associated Angina): PROCARDIA is indicated for the management of chronic stable angina (effort-associated angina) without evidence of vasospasm in patients who remain symptomatic despite adequate doses of beta blockers and/or organic nitrates or who cannot tolerate those agents.

In chronic stable angina (effort-associated angina) PROCARDIA has been effective in controlled trials of up to eight weeks duration in reducing angina frequency and increasing exercise tolerance, but confirmation of sustained effectiveness and evaluation of long-term safety in those patients are incomplete.

Controlled studies in small numbers of patients suggest concomitant use of PROCARDIA and beta blocking agents may be beneficial in patients with chronic stable angina, but available information is not sufficient to predict with confidence the effects of concurrent treatment, especially in patients with compromised left ventricular function or cardiac conduction abnormalities. When introducing such concomitant therapy, care must be taken to monitor blood pressure closely since severe hypotension can occur from the combined effects of the drugs. (See Warnings.)

CONTRAINDICATIONS: Known hypersensitivity reaction to PROCARDIA

WARNINGS: Excessive Hypotension: Although in most patients the hypotensive effect of PROCARDIA is modest and well tolerated, occasional patients have had excessive and poorly tolerated hypotension. These responses have usually occurred during initial titration or at the time of subsequent upward dosage adjustment and may be more likely in patients on concomitant beta blockers.

Severe hypotension and/or increased fluid volume requirements have been reported in patients receiving PROCARDIA together with a beta blocking agent who underwent coronary artery bypass surgery using high dose fentanyl anesthesia. The interaction with high dose fentanyl appears to be due to the combination of PROCARDIA and a beta blocker, but the possibility that it may occur with PROCARDIA alone, with low doses of fentanyl, or with other narcotic analgesics cannot be ruled out. In PROCARDIA treated patients where surgery using high dose fentanyl anesthesia is contemplated, the physician should be aware of these potential problems and, if the patient's condition permits, sufficient time (at least 36 hours) should be allowed for PROCARDIA to be washed out of the body prior to surgery.

Increased Angina: Occasional patients have developed well documented increased frequency, duration or severity of angina on starting PROCARDIA or at the time of dosage increases. The mechanism of this response is not established but could result from decreased coronary perfusion associated with decreased diastolic pressure with increased heart rate, or from increased demand resulting from increased heart rate alone.

Beta Blocker Withdrawal: Patients recently withdrawn from beta blockers may develop a withdrawal syndrome with increased angina, probably related to increased sensitivity to catecholamines. Initiation of PROCARDIA treatment will not prevent this occurrence and might be expected to exacerbate it by provoking reflex catecholamine release. There have been occasional reports of increased angina in a setting of beta blocker withdrawal and PROCARDIA initiation. It is important to taper beta blockers if possible, rather than stopping them abruptly before beginning PROCARDIA.

Congestive Heart Failure: Rarely, patients, usually receiving a beta blocker, have developed heart failure after beginning PROCARDIA. Patients with light aortic stenosis may be at greater risk for such an event.

PRECAUTIONS: General: Hypotension: Because PROCARDIA decreases peripheral vascular resistance, careful monitoring of blood pressure during the initial administration and titration of PROCARDIA is suggested. Close observation is especially recommended for patients already taking medications that are known to lower blood pressure. (See Warnings.)

Peripheral edema: Mild to moderate peripheral edema, typically associated with arterial vasodilation and not due to left ventricular dysfunction, occurs in about one in ten patients treated with PROCARDIA. This edema occurs primarily in the lower extremities and usually responds to diuretic therapy. With patients whose angina is complicated by congestive heart failure, care should be taken to differentiate this peripheral edema from the effects of increasing left ventricular dysfunction.

Drug interactions: Beta-adrenergic blocking agents. (See Indications and Warnings.) Experience in over 1400 patients in a non-comparative clinical trial has shown that concomitant administration of PROCARDIA and beta-blocking agents is usually well tolerated, but there have been occasional literature reports suggesting that the combination may increase the likelihood of congestive heart failure, severe hypotension or exacerbation of angina.

Long-acting nitrates. PROCARDIA may be safely co-administered with nitrates, but there have been no controlled studies to evaluate the antihypertensive effectiveness of this combination.

Digitalis: Administration of PROCARDIA with digoxin increased digoxin levels in nine of twelve normal volunteers. The average increase was 45%. Another investigator found no increase in digoxin levels in thirteen patients with coronary artery disease. In an uncontrolled study of over two hundred patients with congestive heart failure during which digoxin blood levels were not measured, digitalis toxicity was not observed. Since there have been isolated reports of patients with elevated digoxin levels, it is recommended that digoxin levels be monitored when initiating, adjusting, and discontinuing PROCARDIA to avoid possible over- or under-digitalization.

Carcinogenesis, mutagenesis, impairment of fertility: When given to rats prior to mating, nifedipine caused reduced fertility at a dose approximately 30 times the maximum recommended human dose.

Pregnancy: Category C. Please see full prescribing information with reference to teratogenicity in rats, embryotoxicity in rats, mice and rabbits, and abnormalities in monkeys.

ADVERSE REACTIONS: The most common adverse events include dizziness or light-headedness, peripheral edema, nausea, weakness, headache and flushing each occurring in about 10% of patients, transient hypotension in about 5%, palpitation in about 2%, and syncope in about 0.5%. Syncopal episodes did not recur with reduction in the dose of PROCARDIA or concomitant antihypertensive medication. Additionally, the following have been reported: muscle cramps, nervousness, dyspnea, nasal and chest congestion, diarrhea, constipation, inflammation, joint stiffness, shakiness, sleep disturbances, blurred vision, difficulties in balance, dermatitis, pruritus, urticaria, fever, sweating, chills, and sexual difficulties. Very rarely, introduction of PROCARDIA therapy was associated with an increase in anginal pain, possibly due to associated hypotension.

In addition, more serious adverse events were observed, not readily distinguishable from the natural history of the disease in these patients. It remains possible, however, that some or many of these events were drug related. Myocardial infarction occurred in about 4% of patients and congestive heart failure or pulmonary edema in about 2%. Ventricular arrhythmias or conduction disturbances each occurred in fewer than 0.5% of patients.

Laboratory Tests: Rare, mild to moderate, transient elevations of enzymes such as alkaline phosphatase, CPK, LDH, SGOT, and SGPT have been noted, and a single incident of significantly elevated transaminases and alkaline phosphatase was seen in a patient with a history of gall bladder disease after about eleven months of nifedipine therapy. The relationship to PROCARDIA therapy is uncertain. These laboratory abnormalities have rarely been associated with clinical symptoms. Cholestasis, possibly due to PROCARDIA therapy, has been reported twice in the extensive world literature.

HOW SUPPLIED: Each orange, soft gelatin PROCARDIA CAPSULE contains 10 mg of nifedipine. PROCARDIA CAPSULES are supplied in bottles of 100 (NDC 0069-2600-66), 300 (NDC 0069-2600-72), and unit dose (10x10) (NDC 0069-2600-41). The capsules should be protected from light and moisture and stored at controlled room temperature 59° to 77° F (15° to 25° C) in the manufacturer's original container.

More detailed professional information available on request

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PROCARDIA can mean the return to a more normal life for your patients—having fewer anginal attacks,¹ taking fewer nitroglycerin tablets,² doing more, and being more productive once again.

Side effects are usually mild (most frequently reported are dizziness or lightheadedness, peripheral edema, nausea, weakness, headache and flushing, each occurring in about 10% of patients, transient hypotension in about 5%, palpitation in about 2% and syncope in about 0.5%).

Quotes from an unsolicited letter received by Pfizer from an angina patient. While this patient's experience is representative of many unsolicited comments received, not all patients will respond to Procordia, nor will they all respond to the same degree.

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Procordia is indicated for the management of:

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- 2) Angina where the clinical presentation suggests a possible vasospastic component.
- 3) Chronic stable angina without evidence of vasospasm in patients who remain symptomatic despite adequate doses of beta blockers and/or nitrates or who cannot tolerate these agents. In chronic stable angina (effort-associated angina) PROCARDIA has been effective in controlled trials of up to eight weeks' duration in reducing angina frequency and increasing exercise tolerance, but confirmation of sustained effectiveness and evaluation of long-term safety in these patients are incomplete.

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Cytotoxic Drugs in the Treatment of Rheumatic Diseases

PAUL WAYTZ, M.D.*

Cytotoxic drugs have long been available for treating rheumatic diseases, but it has only been within the past decade that their use has become so prominent. Though their benefits may be striking, these drugs should still occupy a tenuous and respected position amidst the modalities offered by a rheumatologist. Advantages and disadvantages of using these agents for conditions which are chronic and often non-lethal must always be weighed.

We now are able to appreciate the complex balance of the limbs of the immune system and the notion that rheumatic diseases may result from changes in either hypofunction, over-stimulation, or both. The rationale for using cytotoxics centers about their role in altering some aspect(s) of the immune process. In certain conditions such as lupus nephritis, polyarteritis nodosa, and Wegener's granulomatosis, we are attempting to abort a life threatening aspect of the disease. In other situations, e.g., erosive rheumatoid or psoriatic arthritis, we are trying to alter the course of the illness and prevent further destruction and disability.

Methotrexate is a folic acid antagonist which inhibits nucleic acid synthesis and effects dividing cells. It has been used for the treatment of psoriasis and psoriatic arthritis, and until recently, was the only cytotoxic approved by the FDA for use in a rheumatic disease. Its efficacy in polymyositis has also been established and many consider it the next choice beyond corticosteroids in refractory cases. Within the past decade, it has been increasingly used for rheumatoid arthritis and formal investigations are currently under way. Side effects include bone marrow sup-

pression, ulceration of mucosal surfaces, pulmonary fibrosis, and hepatic cirrhosis. Of interest, there has been no evidence of an increased risk of malignancy.

Azathioprine is a purine analogue and the only cytotoxic approved for use in rheumatoid arthritis. However, it has been used for other connective tissue diseases, especially lupus nephritis. It is generally well tolerated with major toxicity involving the bone marrow. Reduction of dosage is necessary to avoid toxicity if given concomitantly with Allopurinol. Though the risk is apparently low, the potential for inducing lymphoreticular malignancies does exist.

Cyclophosphamide is an alkylating agent which not only suppresses cell mediated and humoral immunity, but also does have anti-inflammatory effects. It is a potent agent with significant side effects including alopecia, irreversible gonadal damage, hemorrhagic cystitis and a risk of lymphoid neoplasm. Though it has been shown to be effective in severe cases of rheumatoid arthritis and lupus, investigations indicate a major and, perhaps, primary use in certain types of vasculitis, particularly Wegener's granulomatosis.

Chlorambucil is another potent alkylating agent which has been used for numerous connective tissue diseases. Irreversible marrow suppression may be more common than with other cytotoxic drugs, and the potential risk for lymphoid malignancy also exists.

A major role for cytotoxic drugs may be in their ability to not only control inflammatory disease, but also to permit tapering of high dose corticosteroids. These agents have a defined place for many rheumatic conditions, but serious side effects warrant careful medical and ethical consideration.

*Rheumatologist, Minneapolis.

Osteoporosis: Current Research, Prevention, Diagnosis and Treatment.

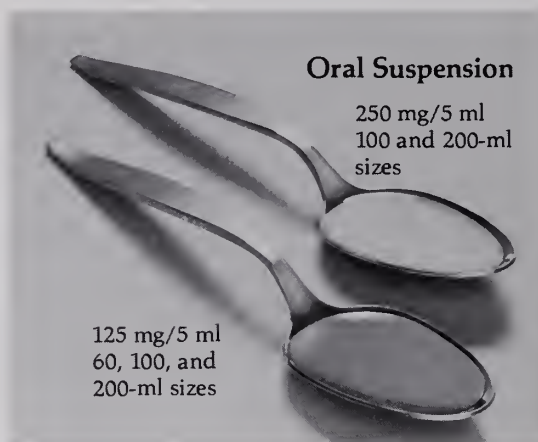
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Hmong Refugees in Minnesota

Characteristics and Self Perceptions

JOSEPH WESTERMEYER, M.D., M.P.H., Ph.D.*; TOU FU VANG, B.S.* and GAOHLI LYFONG*

Four years ago there was a fairly stable population of about 200 Hmong adults and children in Minnesota. A marked influx of Hmong refugees to Minnesota began about two years ago, and it is anticipated that their total numbers here will reach over 20,000 in the 1980s. The results of this survey of Hmong adults in Minnesota should prove useful to clinicians who encounter them as patients.

THE ADJUSTMENT OF Vietnamese refugees has been reportedly proceeding well,¹ although an earlier report was not so optimistic.² Careful assessment has not yet been conducted among the Hmong people from Laos, a group considerably different from the Vietnamese as well as from the Cambodians and Lao refugees. This report provides information regarding the social background, migration, current social status and self-perceived problems among Hmong refugees in Minnesota. Insofar as we have been able to determine, the early Hmong refugees were assigned at random to Minnesota by the State Department. Moreover, at the time of the study there was as yet little of the interregional migration which subsequently occurred among the Hmong. It thus appears that they are a representative of other Hmong refugees who came around the same time.

Background

Several million Hmong people live in China, Vietnam, Laos, Thailand and Burma.³⁻⁵ They inhabit the mountains and ridges of the Annamite Chain, raising upland rice and corn as their staple crops. They also garden, raise farm animals, and hunt. In some times and places, opium poppy has been their cash crop.⁶ Traditionally they have practiced animism and have had an oral rather than written tradition. While a few Hmong people in Laos achieved high levels of education, political prominence and professional achievement, most have lived an independent existence within small autonomous villages.

Chinese literature over centuries has recorded the dogged efforts of the Hmong to reject subjugation by lowland peoples.⁷ A people with a warrior tradition,

they have united under temporary leaders for wars against lowlanders making incursions into their mountain strongholds. Over the period 1950-1975 many Hmong allied themselves with the French, neutral-rightist Lao and Americans in a fight against the northern Vietnamese and leftist Lao.⁸ When this lengthy war was eventually won by the latter groups, many Hmong who had been active in the war began leaving Laos around mid-1975. After living for a time in Thai refugee camps, they began arriving in the United States several months later during early 1976. These earlier refugees may differ from later groups who were not so involved in the earlier war.

Method

All Hmong people in Minnesota were identified through the informal social network which had developed between the time of arrival (early 1976) and the time of data collection (Fall, 1977). The first two authors were instrumental in facilitating the establishment of the Minnesota Hmong Association, which also provided contacts to identify all Hmong residing in Minnesota. Hmong people aged 16 or older were invited to participate. This age was chosen since, in the traditional Hmong context, young people were generally expected to assume adult responsibilities (including marriage and childbearing) by that age. Of 103 potential subjects, 97 accepted our invitation.

The six people refusing participation included 3 married couples in their 20s, all literate and educated beyond elementary school. They had been living in Vientiane, the ethnic Lao capital city, rather than among Hmong people in northern Laos. They voiced suspicion about the purpose of the study. As will be seen from these data, they are not typical of most Hmong refugees by virtue of their previous education and residence.

The research instrument consisted of a number of

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This study was supported in part by the Department of Public Welfare, State of Minnesota.
John Neider and Grace Peng assisted with tabulation of the data.

questions regarding the subject's life in Laos, the migration to the United States, and current conditions and attitudes towards life here. Many of these questions were open-ended ("What is your biggest problem in the United States?") while some were closed-ended ("Have you had a marital problem in the United States?").

The research instrument was translated into Hmong (using a Latinized script), Lao and English, since some subjects are illiterate in one of these but not in others. Since the majority of subjects were functionally illiterate in any language, it was necessary to read the questions and record their answers. The interviewers (Mr. Tou Fu Vang and Ms. Gaohli Lyfong) were both ethnic Hmong, fluent in all three languages, and educated to the college level (Mr. Vang in the United States, Ms. Lyfong in Laos). Interviews were conducted at any place comfortable and convenient to the subject, but usually in the subject's home. Responses to open-ended questions were categorized after reviewing the range of responses.

Demographic Characteristics

Current Age

The average was 30.98 years (standard deviation 13.1). The age distribution of these 97 people resembled that obtained by the Hmong geographer Yang Dao during 1970 among 1591 Hmong people in northern Laos.⁹ The actual ages of these 97 people, and the expected distributions based on Dao's work were as follows:

Age group	Number of People	
	Observed	Expected
16-19 years	16	23.9
20-29 years	40	31.4
30-39 years	18	20.3
40-49 years	10	13.1
50-59 years	8	5.6
over 59 years	5	2.8

Although the observed numbers were higher than expected under age 30 and over age 50, the difference was not statistically significant when tested by the Chi Square method. Thus, the age of this Hmong sample in the U.S. resembled that of Hmong people in Laos.

We asked about "age on American records," as compared to the "actual age" presented above. Forty-one people reported either an older or younger age in the hope that it would enhance their chances for a visa to the United States. Of these 40, 32 who increased their age did so by an average of 5.9 years; and 8 decreased their age by an average of 4.3 years. "Increasers" were all 30 to 50 years of age, and

"decreasers" were 30 to 60 years of age. On the average, this "recorded age" (mean 30.13 years, standard deviation 12.9) was 0.85 years younger than the "actual age." Hmong people do not record their birthdate nor celebrate annual birthdays, so that even the "actual age" was more of an estimate than would be obtained among peoples who record birthdates and celebrate birthdays.*

Sex

There were 52 men and 45 women in the sample. Again using Dao's survey data, the observed and expected numbers were as follows

Sex	Number of people	
	Observed	Expected
Male	53	47.7
Female	45	49.3

Although the sex ratio was slightly the reverse of that expected, the difference was not statistically significant as tested by Chi Square.

Ethnicity and National Origin

All of these subjects identified themselves as Hmong, spoke Hmong fluently and were identified as Hmong by others in Minnesota. Similarly, all subjects reported being born in Laos, were familiar with the geography and historical events in Laos, and had been known in Laos by other Hmong subjects. (A few purported Hmong "refugees" from Laos have actually been ethnic Thai, or ethnic Hmong from Thailand.)

Background in Asia (Table 1)

Prior to becoming refugees, most were still residing in a village. However, about 20% of the subjects had migrated from villages into towns. Largest employment category was "soldier" (of whom 16 had been wounded). Most of the merchants were women who also worked as homemakers (traditional among the Hmong). "Farmers" were mostly older adults, while other occupations tended to be held by younger adults. Among the 78 married persons, 14 of them (i.e., five women and nine men) had two or more spouses. Among those with two or more marriages, 10 had lost spouses and had subsequently remarried.

Over recent decades an increasing number of people have been adopting Christian practice. Those professing Buddhism were young, literate students and others who had lived and studied among Lao people.

Christian missionaries had developed a Latinized script for the Hmong language, which was known by a few Hmong people. A larger number knew how to read and write Lao as a result of education in Lao schools. Time constraints prevented an objective assessment of literacy (which would have required testing in four languages). Instead, a subjective self-assessment was used. A majority were unable to read or write.

*It was possible to ascertain ages by recourse to historical events, however. People generally knew their birthdate relative to such events as the Japanese invasion of Laos, a particular tornado, or the death of a king

Those able to speak a language other than Hmong were predominantly young and male. The most common second language was Lao. Prior to leaving Laos, about three-fourths of these people had no English language training.

Over the period 1960 to 1975 the Hmong people in northern Laos had achieved some sophistication in the use of medical services. A village health program provided access to elementary health care. Similar to the "barefoot doctor" concept in China, Hmong health workers provided on-site care for simple trauma, acute infectious disease, and symptomatic treatment for a variety of ills. In addition, a hospital in Xieng Khouang province had been staffed largely by Hmong personnel. Out of the 97 subjects, 40 had been hospitalized in Laos: 31 on one occasion, 6 twice, and 3 on three occasions. Nine people had undergone major surgery (5 of these related to battle wounds).

Six men had been regular tobacco smokers in Laos. Five men had used opium regularly. This rate of regular opium use was low for a Hmong population from Laos. The expected number would be 15 to 20, based on epidemiological data among the Hmong in Laos and Thailand.^{10,11} (The low rate of previous opium use is probably due to the relatively low number of poppy farmers in the group, to the relatively high number of salaried persons and students, and urine screening for opiates by American immigration officials in Thailand to exclude opium addicts.)

A variety of occupations, skills and leisure time activities existed within traditional Hmong culture. Some of these served the family or Hmong society in important technological and social ways. All provided a sense of identity, role, relaxation, and/or excitement. They included the following:

Activity	Subjects participating (out of 97)
Sewing	46
Fishing	29
Hunting	25
Sports (volleyball, soccer, etc.)	25
Herbalists, herbal healer	13
Plays musical instrument	10
Marriage arranger	9
Blacksmith	7
Animal fighting	7
Spirit healer, religious leader	4
Singer	2
Midwife	2

Coming to the United States

Motivations and Expectations

Open-ended questions were asked regarding: (1) the subjects' reasons for coming to the United States and (2) their expectations of the United States. These responses were tabulated by major theme (Table 2).

TABLE 1
Background in Asia

Characteristic	Number of people
Birthplace	
village	84
town	9
city	3
unknown	1
	97
Residence before migration	
village	63
town	29
city	4
unknown	1
	97
Occupation	
soldier	24
homemaker	21
farmer	16
student	13
merchant	9
skilled worker	9
civil servant	4
religious worker	1
	97
Religion	
Animist	43
Christian*	41
Buddhist	13
	97
Marital Status	
never married	19
ever married	78
	97
Training and Education	
no formal training	34
basic military training	23
technical training†	6
some primary school	18
some high school	8
vocational education‡	7
unknown	1
	97
Literacy in Any Language (self-assessment)	
writing ability	
none	55
fair	31
good	8
fluent	3
	97
reading ability	
none	60
fair	21
good	12
fluent	4
	97
Speaking Ability in Any Non-Hmong Language (self-assessment)	
none	60
fair	23
good	10
fluent	4
	97
English Language Training Prior to Leaving Laos	
none	74
up to 1 year	19
2 years	1
4 years	1
9 years	1
	97

*Protestant — 37, Catholic — 4

†Carpentry, electrician, mechanic

‡teacher training, nursing, clergy assistant, administration

Most subjects reported positive values regarding the United States (e.g., "freedom," "educational opportunity"). A large minority came simply because the family or relatives came. This often involved chance factors, such as where or with whom they were living at the time. At the time of this data collection fear of Communist reprisals had shrunk in current importance, although it was a major factor in the original decision to leave Laos in 1975.

Regarding their expectations in coming here, half of the respondents reported some version of "peace," "no war," or "a peaceful life." Most of these people had seen war at first hand over a period of one or two decades. They had endured refugee moves, loss of friends and relatives, illness and malnutrition directly as a result of the war. So the obsession with peace is not a surprising one. At the same time it indicates a focus more on the past (i.e., life in Laos) than on the present or future (i.e., adaptation to the United States). Other responses (about 30%) focused on betterment of self, children or financial condition. About 15% had no particular expectations, even after having been here an appreciable length of time.

Sponsors

The largest single group of sponsors were church groups, accounting for about three-fourths (Table 2).

TABLE 2

Coming to the United States

<u>Reason for coming to the U.S.</u>	
positive aspects of the U.S.	54
came with family, chance	16
feared Communist reprisals	14
other reasons	11
no response	2
	<u>97</u>
<u>Expectations of life in the U.S.</u>	
lead peaceful life	48
improve self (language, skills)	20
educate children	8
earn more money	3
other responses	4
do not know	10
no response	4
	<u>97</u>
<u>Sponsors</u>	
church groups	76
individual	14
friend	3
relative	3
unknown	1
	<u>97</u>
<u>Frequency of Visits with Sponsor</u>	
about weekly	11
about monthly	29
less than monthly	28
when called only	3
never	22
not applicable (relatives, sponsor not known)	4
	<u>97</u>

Next largest group were individual Americans whom the subjects had not known. A few people were sponsored by American acquaintances from the past, and a few people coming later were sponsored by relatives who had come earlier. As gauged by frequency of visits, the current relationship with many sponsors was not an active one (Table 2).

A major complaint was the inequity in the material support which they received from sponsors. During refugee moves in Laos and later in Thailand they had become accustomed to a highly equitable, if meager distribution of rice, cooking and eating utensils, blankets and shelter. In the United States, they avidly discussed the resources allocated to them by their respective sponsors. Virtually every person could point to someone who received more or better of some resources, leading them to feel that they had been deprived by their sponsors of resources and materials which they believed had been intended for them by the United States government. Consequently, we were interested in learning about the distribution of material goods by sponsors soon after their arrival here. Responses were as follows:

Type of benefit	Number of subjects receiving (out of 97)
Clothes	77
Food	67
Cooking utensils	36
Appliances	28
Cash (besides welfare)	20
Automobile	3

Life in the United States: Changes and Problems

Family Changes

There were numerous family changes in Laos and Thailand. Families were divided in Laos during hasty decisions regarding who wanted to leave, should leave, or could leave. Children, spouses, parents and others were left behind. Casual friends or distant relatives might join them. Again in the Thai refugee camps, there were changes. American immigration policies favored nuclear families and actually worked against the co-migration of any extended family over several persons (although the extended kin group serves both utilitarian and psychological functions among the Hmong). Separation and divorce increased under the social, psychological and economic pressures of the situation.

This sample experienced little disruptive family change during this early period in the United States. Four people got married for the first time. Another thirty-eight men and women had a child born in the United States (a total of 24 children had been born in the U.S. prior to this survey). There were as yet no deaths or divorces in the United States.

Change in Religion

Twenty-eight people changed their religion in the United States, at least nominally. They were animists who changed to the religion of their sponsoring church agency (e.g., Lutheranism, Catholicism, Baptist). This has created problems in that extended kin members, and even some nuclear kin now belong to different religions. Consequently, even though they might live together, they have been told not to attend church together. In a few instances, they have been instructed not to participate in important life rituals of their closest kin (such as marriage). Such individuals are caught in a double bind between their loyalties to their Hmong family and to their American sponsors. The issue is not a denominational or theological one for these Hmong who often have thus far merely translated their Hmong animistic cosmology into Christian terminology.

Change in Leisure/Part-Time Activities

Fifty-eight out of 97 people reported a change in their leisure/part-time activities. They had not resumed (at least so far) such activities as hunting, animal fighting, blacksmithing, marriage negotiating, and midwifery. A few had resumed fishing, herbal or spirit healing, music, and singing, but most had not. The primary activity which continued was sewing, particularly the artful embroidery engaged in by women.

Change in Substance Use

Four opium addicts and 1 opium user had become abstinent for opioid abuse. One of these individuals had subsequently become psychologically incapacitated by depression and chronic pain. Another was working two jobs and had resumed his former status as an extended family leader. The number is too small to draw general conclusions about this subpopulation.

Eight men remarked that they had reduced their occasional use of alcohol, and one had stopped smoking tobacco. Finances were given as a reason.

Types of Problems

Subjects were asked if they were having problems in the United States related to their finances, mental or emotional well-being, health, marriage (12 were single during the entire period under study), or legal status. Their responses were as follows:

Type of problem	Present	Absent	Not applicable	Total
Financial	70	27	0	97
Mental or emotional	61	36	0	97
Health	40	57	0	97
Marital	29	56	12	97
Legal	3	94	0	97

Financial problems were related to their low current income, the higher cost of food and rent here, and both

actual as well as perceived need for new material possessions in this setting (e.g., heavy winter coats, "American" clothes, house furnishings, transportation).

Mental/emotional problems were highly correlated with health problems, since many of the latter were somatic symptoms associated with the former. This issue will be addressed more fully in subsequent reports.

Some marital problems which had begun in Thailand continued here, although many marital problems began anew here. These also involved complex issues which must be considered more fully elsewhere. Suffice it to say here that many other factors elucidated in the survey (e.g., extended family disruption, unemployment, financial problems, focus on the past rather than the future) fueled these dissensions.

Legal problems resulted from illiteracy and a lack of awareness regarding rules in this society. People unable to read "no parking" signs, or unfamiliar with speed limits and nuances of credit and contracts encountered minor difficulties (but which often seemed very major and costly to the Hmong people involved). While more serious problems have occurred subsequently (e.g., child and spouse abuse, "bride capture" or kidnapping), these were not encountered in this study.

Welfare

Fifty-one people were currently being supported on welfare. Another 8 people were receiving other forms of support (pension, disability, educational or training grants). Thirty-eight were not receiving any governmental support.

This comprised a major dilemma for many Hmong subjects. They preferred an independent existence to life under continued agency or government surveillance. At the same time, suitable work was not available (e.g., farming, gardening, hunting), and available work was temporary or unacceptable to them. In order to pursue education and learn English, they had to accept welfare status.

Changes from the First to the Second Year

The direction and extent of changes from the first to the second year was investigated in order to appreciate the Hmong adjustment to a markedly different cultural and ecological milieu. For the average subject, this was a comparison between the first 12 months in the United States and the six months prior to the study.

Geographic Mobility

During the first year about 40% changed residence, most often to another town or state (Table 3). During the second year almost 70% had already changed

residence, again most often to another town or state. This increase was highly significant on statistical testing at the .001 level of probability.

Geographic mobility has been a part of Hmong culture for centuries. Their predominantly slash-and-burn agricultural technology requires that most Hmong must move their villages every several years to an area of fallow land. Migration is also a mechanism for resolving intrafamily conflict, or interhousehold conflict within a village. Besides having a tradition for mobility, many Hmong families in the United States sought to reestablish their extended family/clan/village ties which had been rent by the immigration process.

Many households included non-nuclear family members (e.g., grandparents, uncles and aunts, siblings of parents, cousins). While there was a small

decrease in size of household from the first to the second year, this was not statistically significant (see Table 3).

Employment

There were six people who held "skilled" jobs in the first year and continued with them into the second year (Table 3). They were literate men and women in their twenties, with previous experience in nursing, teaching and administration. Their positions were in schools, social agencies and hospitals as translators and community aides. While paying less than factory jobs, these positions gave them high status within the Hmong community. These were demanding positions at the margins of the Hmong and majority societies, but they provided an opportunity to serve one's own people, to be occupied with current problems instead of dwelling

TABLE 3
Changes From First to Second Year

Characteristic	Number of People		Statistical Significance*
	First Year	Second Year	
<u>Change in residence</u>			
no change	57	31	
different residence, same town	12	23	2 X = 13.4825 1 P < .001
different town,	4 } 39	4 } 66	
same state	23	39	
different state	1	0	
no response	97	97	
<u>Number of people in household</u>			
mean	7.00	6.57	"t" = 1.4531
standard deviation	2.1	2.0	(two tailed, 190 d.f.)
number of subjects	97	97	P = not significant
<u>Employment</u>			
none	46	56	
unskilled	45 } 51	34 } 40	2 X = 1.9138 1 P = not significant
skilled	6	6	
no response	0	1	
	97	97	
<u>Training</u>			
none	30	19	
English-as-second- language	64 } 66	64 } 77	2 X = 2.7401 1 P = not significant
other training†	2	13	
no response	1	9	
	97	97	
<u>Education</u>			
none	79	72	
primary school	2 } 18	1 } 24	2 X = 0.8229 1 P = not significant
secondary school	9	14	
college	0	1	
other education‡	7	8	
no response	0	1	
	97	97	

*Unknown or absent responses are not included in statistical testing; categories have been combined for purposes of statistical testing

†drivers training, on-the-job training (with or without ESL)

‡special adult classes, continuing education, health or welfare conferences, vocational education.

on the past, and to work towards a better Hmong destiny.

Employment at unskilled tasks was a different story. None of these subjects had been continuously employed for twelve months at any one job. Their positions required neither English speaking ability nor a high school education. Such jobs included piece work on conveyer lines, janitor, dishwashing, car washing, handling garbage, and so forth. Several worked on undesirable shifts (i.e., nighttime, weekends) in the company of other Hmong people. A few had been fired from their positions, and seasonal and economic fluctuations often led to lay-offs. A large number left these jobs voluntarily to make a residence change, because of boredom, or to go on welfare in order to attend English language training.

Almost half were unemployed during the first year. This number increased by about 10% into the second year, but the increase was not statistically significant. During the first year most of the unemployed were women (i.e., 33 women and 13 men); but in the second year women were more similar to men (i.e., 30 women and 25 men).

Training and Education

During both the first and second years, about two-thirds attended English-as-a-second-language (ESL) courses. During the first year only two people took additional training: both were learning how to drive. Training increased during the second year and included several people receiving on-the-job training or technical training, in addition to several people learning to drive. The number of people engaged in any training increased from about 70% to about 80%. This 10% increase was not statistically significant (Table 3).

There was an increase in the number of people engaged in educational pursuits. Several people in their late teens and early twenties, who had been in Laotian secondary schools three to five years previously, resumed their high school education. One Hmong student graduated from high school and entered college. Adult special education continued, primarily among the "skilled" workers described above.

Social, Medical and Material Resources in the United States

Contacts with Other Hmong

About 70% of subjects lived within a mile of another Hmong household (Table 4). For those at a greater distance, social isolation was a major complaint among all except the few able to communicate well in English. Among those within walking distance of other Hmong, about half exchanged household visits at least on a

TABLE 4

Resources in the United States

Characteristic	Number of people
Proximity of household to other Hmong	
100 yards or less	62
over 100 yards to 1 mile	6
over 1 mile to 10 miles	6
over 10 miles to 50 miles	17
over 50 miles to 100 miles	5
no response	1
	97
Average frequency of visits with other Hmong	
daily	15
weekly	23
monthly	11
less than monthly	39
almost never	8
no response	1
	97
Average frequency of phone calls to other Hmong	
daily	15
weekly	23
monthly	11
less than monthly	39
almost never	8
no response	1
	97

weekly basis. For others, mutual exchanges at English classes, work, or school sufficed.

Phone calls were especially important for those isolated away from other Hmong people, or from their extended family. Long distance phone calls were the greatest monthly expenditure for many of these families at times. This was especially important for those unable to read or write (and thus unable to send and receive mail). Use of tape recorders (with mailing of cassettes) began within a few months of arrival as a means of keeping in touch with relatives in the United States and Thailand.

Only one person was living alone. There were at least three people in all other households. Seventy-eight people had one or more of their children living with them at the time of interview (mean 4.0 children per person, standard deviation 3.0).

Access to Translators

Sixty-nine subjects said they had access to a Hmong person who could translate into English for them. Nine knew a local American who could understand Lao or Hmong. Initially this placed a tremendous burden on the few English speaking Hmong, who were called on for numerous crises, communications, and problems vis-a-vis the majority society. Towards the end of this period adults had begun to rely upon their school age children, who had become much more fluent than themselves in English. The latter situation has been more convenient, but has reversed traditional dependency and representational roles and led to problems in child-adult relations.

Treatment Seeking

Relatively few people had sought treatment from a traditional healer since their arrival in the United States. Reasons for this varied, but two common responses were "the right herbs are not here" and "the spirits which guarded us and afflicted us (such as ancestor spirits) are back in Laos, not here." On the contrary, about half were using clinic and hospital facilities here. Distribution was as follows

Type of resource	Number of people		
	Present	Absent	Total
Hospitalization or emergency room	51	46	97
Clinic or outpatient	45	52	97
Traditional healing	8	89	97

There was a trend for those who used treatment facilities to use them often. For example, among 51 people who visited emergency rooms or were hospitalized, 13 went to a hospital once, 15 went two-to-four times, and 23 went five times or more.

Material Possessions

Current ownership of certain material possessions was as follows:

Item	Number of people owning
Refrigerator and/or stove	29
Television	28
Clothes washer	20
Adequate cooking utensils	14
Automobile	8
Home	4

Opinions and Attitudes

How Do You Feel About Being in the United States?

About 60% stated they felt happy to be here (Table 5). One-fourth reported negative feelings including missing significant persons back in Asia, missing their homeland, worry about the future, and the complicated, even overwhelming task of adjusting to complex life in the United States. A large minority gave ambivalent responses, said they did not know how they felt, or chose not to respond.

What is Your Outlook for the Future?

Subjects were less optimistic about their future here (Table 5). Only one-fourth gave positive responses, while about 30% gave pessimistic ones. A large number evidenced confusion or ambivalence.

What Are Your Future Plans?

The three most common plans involved some kind of adaptation to or preparation for life in the United States (Table 5). Other plans, such as buying a house or a car, were reported by those who were employed and getting along well. The largest category of "no plans" was mentioned by 30 people.

Would You Return to Asia?

Over half said they would return, usually with a

qualifier such as "if there is peace" or "if other Hmong return" (Table 5). The next biggest group said they would not return, or could see no opportunity for returning. Again, a large minority were ambivalent or undecided.

What is Your Current Biggest Problem? Your Second Biggest Problem?

Responses were as follows:

Problem	Number of subjects	
	Biggest	Second biggest
English language	54	7
Finances	14	11
Family	6	14
Housing	5	4
Employment	3	10
Lack skills (vocational, driving)	3	23
Miscellaneous	6	15
No problems	5	12
No response	1	1
	97	97

The large number of people reporting English as a problem was somewhat unexpected, since this was not an ordinary topic of conversation or complaint. But most of these subjects independently assigned it as their first priority. This must be viewed against the background that most subjects, exposed to English only in their classes for a few hours each day, had not attained even rudimentary English language skills after many months of training. Since most were not working with

TABLE 5

Current Opinions and Attitudes

Characteristic	Number of people
Feeling about being in U.S.	
Happy to be here	59
Lonely, homesick, worried, "too much hassle"	23
Undecided or cannot say	4
Ambivalent responses	3
No response	8
	97
Future outlook	
Good, hopeful	24
Bad, gloomy	30
Do not know	35
Ambivalent responses	3
No response	5
	97
Future plans	
Get a good job	26
Learn English	19
Vocational training	11
Other plans	10
No plans	30
No response	1
	97
Return to Asia	
Yes, if . . .	56
No, no opportunity	21
Undecided, do not know	15
Other responses	4
No response	1
	97

English speaking people, had no English speaking friends, and spoke Hmong at all other times outside class, their linguistic ability was growing at a snail's pace. (We have observed that this has continued, so that many Hmong adults who have been here for 4 to 5 years and have had years of ESL training still cannot converse, even though they know a few trite phrases.)

Discussion

Contrast with Vietnamese Refugees.

These Hmong subjects differed in several ways from the Vietnamese people studied by Vignes and Hall ($n = 114$)¹ and Lin et al. ($n = 152$).² The Hmong were a few years younger on the average, even if the difference in age ranges were taken into account. Among the Vietnamese samples, 83%¹ and 67%² had completed secondary school. Only one Hmong person in this sample had completed secondary school (although 8% had some secondary school experience). None of the Vietnamese were illiterate, whereas most of the Hmong were. Most Hmong over the age of 20 were married, whereas about half of a Vietnamese group² were unmarried. This probably reflects both cultural differences (the Hmong married earlier in Asia) as well as educational and social class differences.

The Vietnamese sample studied by Vignes and Hall¹ had been in the United States about as long as these Hmong. However, only 4% of Vietnamese families were on welfare as compared to a much higher Hmong rate.

Vietnamese migrants may have greater familiarity with the jobs available to recent migrants (e.g., factories, restaurants, hotels). However, in their later study Lin et al. found a 46% unemployment rate — similar to that of the Hmong.

There were more men in all three samples, but relatively more men among the Vietnamese (60%¹ and 66%²) than among the Hmong (54%). Many single, young Vietnamese soldiers left Asia without family. However, even as soldiers the Hmong tended to be near their families and migrated with their families. About one-fourth of both the Vietnamese² and the Hmong had been in the military (about one-half if only men are

counted).

These Hmong subjects identified marital, emotional and mental problems as some of their more major problems in the United States. Lin et al.² obtained similar reports from the Vietnamese.

Adjustment by the Hmong to the United States

Most Hmong subjects arrived in the United States poorly prepared by education and training for life in the United States. They appear well aware of that fact and are trying to prepare themselves for life here. Their first priority is facility in English. While they are studying to master it, the lack of opportunity to speak it at work or with English speaking friends has crippled these efforts for many. The dysfunction between their skills and the opportunities here is associated with a high self-report of financial, mental/emotional, health and marital problems.

The sponsorship program has not proven a resource to most Hmong people over the intermediate term, although many received early material assistance. The inequity in the latter, however, appeared to sow the seeds of suspicion and of an attitude towards this country as an unfair place. The focus on church sponsorship has led to expectations of religious conversion (whether refugee-induced or parish-induced), and this has led to disruption of kinship ties in some cases.

The American experience has demanded some major shifts in self concept among the Hmong. Although they value their independence highly, they have had to accept continued dependence on welfare. Whereas in Asia they tended to be wealthier and more industrious than adjacent peoples,⁵ here they have much greater poverty relative to others in the community.

Certain Hmong traditions appear to be persisting here. They are staying together in families, and they readily undertake "secondary migrations" to live near extended kin members. They are using local resources (such as training programs, schools, clinics and hospitals) and local technologies (such as the phone and tape recorders) to meet their various needs and to enhance their lives.

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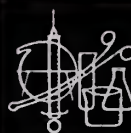
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Common Running Injuries of the Leg and Foot

ROB JOHNSON, M.D.*

RUNNING IS a primary activity in track and cross-country and an accessory training activity for most organized and recreational sports. In addition, running as a form of aerobic exercise has increased tremendously in recent years. As a result, there has been an increase in injuries related to this activity.

The purpose of this article is to assist the health professional in recognizing pain patterns that suggest some of the more common running injuries of the leg and foot. Through recognition, the severity and disability of such injuries may be reduced.

Factors Related to Injuries

Approximately 60 percent of running injuries are a result of training errors, including the following:

- Increasing mileage too rapidly
- Excessive interval training
- Too much speed work on hills
- Running on poor surfaces
- Lack of flexibility training

In addition, previous injuries from other sports and activities, biomechanical alignment problems, excessive toe running, and old, worn, or improper footwear may also contribute to the incidence of injury.

Pain Patterns of Specific Injuries

Certainly, all injuries do not occur in the same manner; but generally the location of the pain, the history of the development of pain, and the characteristics of the pain during activity will suggest a specific injury.

Lower Leg Pain

The most common injury of the lower leg is that of shin splints. Classic shin splints are associated with pain along the lower inside two-thirds of the shin just adjacent to the tibia (Figure 1). Initially, pain will occur at this site following completion of activity. As the problem progresses, pain may be experienced by the individual while running. Typically, this is caused

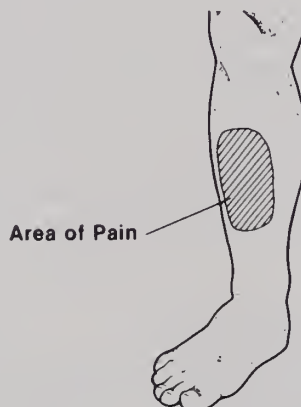


Figure 1
Shin Splints



*Family practice and sports medicine physician in Edina, Eden Prairie and Burnsville. Reprinted from *Sideline View*, May, 1982. By permission of *Sideline View*, the Institute for Athletic Medicine, and the authors.

by running on hard, irregular surfaces. Shin splints may also occur as the result of inadequate support at the arch of the foot, flat feet, or from excessive foot pronation. Pronation is the continuous inward rolling of the foot that commences when the foot first strikes the ground with the heel and ends with a push off the toe. Running on banked surfaces of roads or tracks and/or wearing running shoes that have improper shock absorption properties contribute to this problem.

A less common, but nevertheless painful injury, is the anterior compartment syndrome. This syndrome typically causes pain in the upper one-half to two-thirds of the outside lower leg as indicated in Figure 2. This pain may also extend to the tendons which are the dorsiflexors of the foot. Some factors associated with this problem include: changing of the running style from "flat-footed" to "toe-running" initiating excessive interval or speed training on a track or hill, and running in shoes that have too much flexibility in the sole. True compartment syndromes with increased pressure are very rare.

The lateral compartment syndrome usually causes pain along the ankle and lower outer aspect of the lower leg and ankle (Figure 2). This injury gives the sensation either of pain along the outside of the ankle or the ankle "giving out" during activity. Such pain occurs commonly in athletes who display an excessive pronation, or rolling in of the foot and arch, when running.

Stress fractures of the lower leg may also mimic any of the pain syndromes identified above. To differentiate stress fractures from other injuries, one must be suspicious if there has been no improvement in the condition despite appropriate training adjustments. Often, a stress fracture can be identified if the pain is located in one specific area and is not diffused over a large area, as described in the previous conditions.

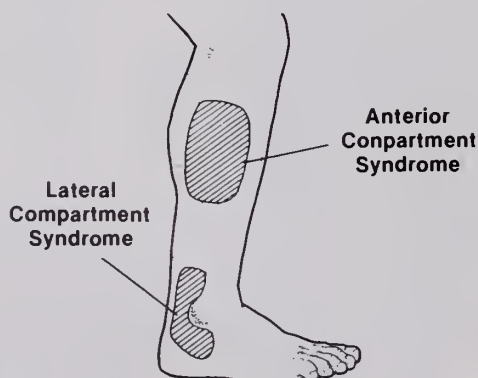


Figure 2
Pain Areas:
Anterior and Lateral Compartment Syndromes

Stress fractures may not appear on a standard Xray for two to eight weeks after the onset of symptoms. If indicated, a limited bone scan will confirm the diagnosis.

Foot Pain

Achilles tendinitis is one of the two common running injuries of the foot. Typically, the athlete with this problem will complain of burning pain in the area of the Achilles tendon (Figure 3) during the initial stages of running; swelling may also be present. The pain becomes much worse after running and subsequently increases upon rising in the morning. However, the pain may decrease during the day until the next training session begins. Factors related to this problem include: excessive hill running, use of shoes with rigid soles, lack of gastrocnemius-soleus flexibility, and excessive pronation of the feet.

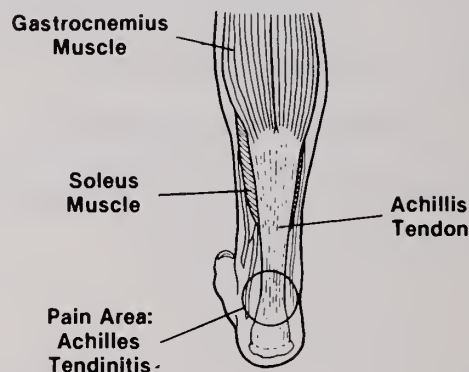


Figure 3
Achilles Tendon

Plantar fasciitis is the most common cause of heel pain. This may be associated with excessive pronation of the foot while running, the presence of "flat feet" or feet with very high arches. In Figure 4 it can be seen at the plantar fascia in the arch from the toes to the heel of the foot, a form of bow and bowstring structure. While running, the bowstring or plantar fascia is stretched when the foot is flattened, resulting in pain. Typically, the pain will occur at the inner aspect of the heel and radiate toward the toe. During training, the pain develops early in the run but diminishes as the athlete continues running. However, it continues as a persistent problem from day to day and from training session to training session. In time, an actual osteophyte or bone spur may occur at the insertion of the plantar fascia on the calcaneus.

Stress fractures of the foot are common. The usual location of the fracture and the resulting pain is in the metatarsals (Figure 4). In recognizing this injury, one

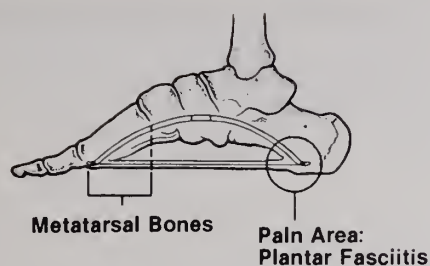


Figure 4
"Bowstring" - Longitudinal Arch of Right Foot

must be suspicious of pain that: 1) is chronic, 2) does not follow a specific pattern, 3) is persistently painful, and 4) localizes to a particular bone of the foot.

Prevention

While it is essential to detect and treat common

running injuries appropriately, it is even more important to prevent them. In the Table specific running injuries, the signs/symptoms of the injuries, and their treatment and prevention are identified. The best preventive measures include incorporation of a comprehensive flexibility stretching program, proper training techniques, and the use of footwear providing adequate support.

The purpose of this article is to assist in early recognition of injuries to the lower leg and foot so that training adjustments can be used to minimize and, hopefully, to alleviate injuries. Further, it is intended to increase an awareness of common problems runners may encounter so that appropriate preventive measures can be utilized.

The runner will be reluctant to discontinue training completely. It has also been my experience that most running injuries do not require complete cessation of

TABLE

Running Injuries of the Leg and Foot

INJURY	SIGNS/SYMPTOMS	TREATMENT*	PREVENTION
Shin Splints posterior tibial tendinitis	Pain along lower 2/3 of inner part of tibia (Figure 1)	Ice ⁶ Reduce amount of activity Use complete flexibility exercise program	Wear proper shoes including heel cushion (15 mm thick) minimum Run on soft, regular surfaces Incorporate flexibility exercises in warmup & cool down Limit excessive pronation of feet using orthotics or special shoes. ⁶
Anterior Compartment Syndrome	Pain along upper 1/2-2/3 along outside of shin bone (Figure 2)	Ice ⁶ Decrease speed work ³ Change footwear	Wear proper shoes Use proper level of speed work Strengthen foot dorsiflexors
Lateral Compartment Syndrome	Pain at outside area of lower leg and ankle (Figure 2)	Use proper shoe support ¹ Analyze foot mechanics while running	Use shoe alterations, to prevent excessive pronation, including: varus wedges heel counter reinforcement foot orthotics ¹ Strengthen muscles, isometri- cally, along outside of leg and ankle. For example: exercises pushing foot to the outside against a fixed object. ¹
Stress Fractures	Localized pain	Rest ⁶ 4-8 weeks Maintain muscle strength of injured extremity ¹ Use alternative exercise to maintain fitness ³	Increase the levels of heavy training gradually.
Achilles Tendinitis	Pain in posterior aspect of ankle, 2-3" above heel inser- tion of achilles tendon (Figure 3)	Use flexibility training for hamstrings and achilles tendon ³ Decrease hill running ¹ Decrease mileage ¹ Use a heel wedge ¹	Increase strength and flexibility of achilles tendon muscle- tendon unit ³ Use of footwear with flexible soles and good heel support Run on soft surfaces ⁶ Control foot pronation
Plantar Fasciitis	Pain at inner aspect under the heel radiating toward the toe (Figure 4)	Use heel pads or heel cups to lift heels ⁶ Include supports for arch ⁶ Reduce mileage Rest until pain subsides	Wear shoes with: adequate arch supports and flexible soles ⁶ Control excessive foot prona- tion Include flexibility exercises for hamstrings and lower leg muscles ¹

*If injury/pain progresses, regardless of treatment, prompt attention by a physician knowledgeable in running injuries is essential.

the sport. Rather, training modifications such as every other day training and reduction in mileage and intensity will usually permit the runner's training to continue, yet enabling the injury to heal satisfactorily.

Should complete cessation of running be necessary for resolution of the injuries, the physician must provide alternative aerobic activities during the healing phase.

AMA Scientific Reports

Each year the AMA House of Delegates approves numerous scientific reports prepared by the Council on Scientific Affairs. These are concise, highly informative, and oriented to the needs and interests of practitioners. The MMA Interspecialty Council reviews these reports and encourages individual physician members to obtain reports which pertain to their practice.

Reports on the following subjects were accepted at the MMA Interim Meeting in December:

- Pneumococcal, Influenza and Hepatitis-B Vaccine
- Percutaneous Transluminal Angioplasty (PTA)
- Calcium Channel Blocking Agents
- Dietary and Pharmacologic Therapy of the Lipid Risk Factors
- Cochlear Implants
- Addition of Thiamine to Alcoholic Beverages
- In-Utero Fetal Surgery
- Physician Mortality and Suicide
- Automobile-Related Injuries

If you would like a copy of any of these reports, contact Teresa Rogstad at the MMA Office (2221 University Avenue S.E., Suite 400, Minneapolis, Minnesota 55414, 612/378-1875).

Chemical Dependency and Family Intimacy

Residential Summer Institute

July 17-22, 1983

Wilder Forest

Marine-on-St. Croix, Minnesota

SPONSORED BY: Program in Human Sexuality, Department of Family Practice and Community Health, Medical School, University of Minnesota.

FEE: \$395 (includes lodging and meals)

The residential Summer Institute in Chemical Dependency and Family Intimacy is designed to improve client service delivery by teaching chemical dependency counseling professionals to focus on the intimacy and sexuality concerns accompanying the chemical use problems of individuals and families.

For Further Information Contact: Coordinator, CDFI Summer Institute, Program in Human Sexuality, University of Minnesota, 2630 University Avenue S.E., Minneapolis, MN 55414, (612) 376-7520.

Echoes from Our Past

The Tribulations of a Country Obstetrician

JACK D. KEY, M.A., M.S.*

A Dr. Pierre in an article, in *Praticien* (Paris) 11:25-30, 1888 (taken from the *Gazette Medicale de Picardie*), gives a very amusing account of his experiences as a country obstetrician. On one of his cases he assisted at the birth of a child born out of wedlock — the mother of the mother was highly indignant, not at the condition of her daughter (that seemed to be a small matter), but that the father was not present at the birth. This indignity which so upset her was finally resolved by the arrival of the offending party. Another case can well be given in his own style:

I was on duty at the Hospital Saint Antoine. One night, about one o'clock, I was awakened to receive a patient. She brought with her in her arms an infant that was nearly naked. I received her as an urgent case. The next day she gave me her history, but I will let her speak for herself: 'I am a very gay person, sir. I love the ball. I have not absented myself during my pregnancy, which yesterday passed the seventh month. At ten o'clock last evening I was one of the first at the dance, near the Place du Trone. I did my best. After several country dances I felt pains. So much the worse, said I, if it is coming this evening, as I have not reached my full time. I will leave the hall as late as possible. But the pains continued. The more I suffered the more I danced. In the cavalier seul, which at our balls leaves the ladies to dance alone, seized with sharp pains, I made astonishing contortions while dancing. I had a remarkable success. Then the gallop followed, in which I seized my partner with a vigor I did not know I was capable of, when suddenly the waters broke. The accident was observed, but was attributed to a different cause. The jokes rained on me. I tried to escape; they pursued me. I ran out; they followed me. I passed down the Boulevard Mazas; some thirty of them were at my heels. Where the Mede Charenton branches off I climbed over the board fence of a wood-yard. Fortunately, my pursuers had lost track of me. I sat on the ground; it was time; the child came five minutes afterwards. I have wrapped it up in my handkerchief; and small as it is, I think it will live.'

Both mother and child did well, and she left the hospital ten days later without any disagreeable complications.

*Librarian, Mayo Clinic, Rochester Minnesota.

Cover Photograph

“Minnehaha Spring”

Dr. Frances Schaar, a Minneapolis pediatrician, is a most enthusiastic and excellent photographer. She is a member of numerous photographic clubs, and through the years, has developed unique techniques for taking excellent photographs.

The cover photograph was taken from a bridge over Minnehaha Creek in the Spring. She used a Nikon camera.

She joined the Doctor's Photo Club a few years back, and the first year she was a member won the Club's prize for the best photograph taken.

Dr. Schaar is a charming, very interesting person and delighted the editors with her stories of her past participation in photography clubs. She is a well recognized oil painter, and several of her paintings have graced the covers of MINNESOTA MEDICINE.

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Minnesota Medical Association

CME in Minnesota

Provided through the Medical Education Subcommittee on CME Resources

For assistance with scheduling meetings, please contact the MMA office (address and phone given below) for information on future medical meetings and CME courses at the state and national level.

Information for each entry is arranged as follows: Date: Name of program; Primary sponsor; Location; Contact person.

July, 1983

8-9 Women in Medicine Symposium; U of M Earle Brown Center, St. Paul; CONTACT: CME, U of M, Box 293 Mayo Memorial Bldg., 420 Delaware St. S.E., Minneapolis, MN 55455; 612/373-8012.

8-21 Orient-Express Adventure; North Central Medical Conference; CONTACT: Betty Schmid, North Central Medical Conference, 2221 University Ave. S.E., Suite 400, Minneapolis, MN 55414; 612/378-1875.

20 Cardio-Vascular Surgery Update; Central Mesabi Medical Center; Central Mesabi Medical Center; CONTACT: Ben P. Owens, Mesaba Clinic, Hibbing, MN 55746; 218/262-3441.

July 22-August 3 Main River Adventure, North Central Medical Conference; CONTACT: North Central Medical Conference, 2221 University Ave. S.E., Suite 400, Minneapolis, MN 55414; 612/378-1875.

July 28-30 Orthopaedic Surgery: Hip Replacement; U of M; Hyatt Regency Hotel, Nicollet Mall, Minneapolis, MN CONTACT: CME, U of M, Box 293 Mayo Memorial Bldg., 420 Delaware St. S.E., Minneapolis, MN 55455; 612/373/8012.

August, 1983

8-10 Limb Salvage & Reconstruction Application of Microvascular Techniques & Alternative Methods; Mayo Clinic; Rochester; CONTACT: Postgraduate Courses Mayo Clinic, 200 1st Street S.W., Rochester, Minnesota 55905; 507/284-2085.

16 The Menopause — Risks and Benefits of Estrogen Progestron Therapy; Central Mesabi Medical Center; Central Mesabi Medical Center; CONTACT: Ben P. Owens, Mesaba Clinic, Hibbing, MN 55746; 218/262-3441.

18-20 Leadbetter Symposium — Urolithiasis; U of M; Willey Hall; CONTACT: CME, U of M Box 293 Mayo Memorial Building, 420 Delaware Street S.E., Minneapolis, MN 55455, 612/373-8012.

22-24 Advanced Cardiac Life Support Course; North Memorial Medical Center; NMMC; CONTACT: William Nelson, 3300 Oakdale North, Robbinsdale, MN 55422; 612/520-5200.

25-26 Nursing Home Medical Directors Meeting; U of M; Mayo Memorial Auditorium; CONTACT: CME U of M, Box 293 Mayo Memorial Bldg., 420 Delaware St., S.E., Minneapolis, MN 55455; 612/373/8012.

29-30 Basic Life Support Course; Methodist Hospital; Methodist Hospital; CONTACT: Janell Haugen, Methodist Hospital, 6500 Excelsior Boulevard, P.O. Box 650, Minneapolis, MN 55440; 612/932-5189.

September, 1983

9-10 Foot & Ankle Care of the Adult Patient; Mayo Clinic; Rochester; CONTACT: Postgraduate Courses, Mayo Clinic, 200 1st St. S.W., Rochester, MN 55905; 507/284-2085.

12-16 Radiology/83 Special Imaging; U of M; West Bank Auditorium, Willey Hall; CONTACT CME U of M, Box 293, Mayo Memorial Bldg., 420 Delaware Street S.E., Minneapolis, MN 55455; 612/373-8012.

12-23 First Annual Graduate Occupational Health and Safety Institute; U of M Medical School & Midwest Center for Occupational Health and Safety; Earle Brown Center, U of M; CONTACT: Ruth McIntyre, St. Paul-Ramsey Medical Center, 640 Jackson Street, St. Paul, MN 55101; 612/221-3992.

16-17 Orthopedic Nursing in the 80's; Metropolitan Medical Center and Hennepin County Medical Center; Pillsbury Auditorium Hennepin County Medical Center; CONTACT: Rose Jagodzinski, 701 Park Ave. S., Orthopedic Office 813, Minneapolis, MN 55415; 612/347-2812.

16-17 Annual Meeting, Minnesota Orthopedic Society; Minneapolis; CONTACT: Jack M. Bert, M.D., 307 Gallery Medical Bldg., 17 W. Exchange St., St. Paul, MN 55102.

16-17 Pediatric Update for Primary Care Physicians; St. Paul-Ramsey Medical Center and U of M Medical School; The Saint Paul Hotel; CONTACT: Ruth McIntyre, 640 Jackson Street, St. Paul, MN 55101; 612/221-3992.

19-21 Pulmonary Disease — 1983; Mayo Clinic; Rochester; CONTACT: Postgraduate Courses, Mayo Clinic, 200 1st St. S.W., Rochester, MN 55905; 507/284-2085.

20 Annual Meeting, MN Physiatrie Society; Edgewood Restaurant, Cannon Falls; CONTACT: Donald J. Erickson, M.D. Emeritus, Mayo Clinic, Rochester, MN 55901.

21 Medical Chest; Central Mesabi Medical Center; Central Mesabi Medical Center; CONTACT: Ben P. Owens, Mesaba Clinic, Hibbing, MN 55746; 218/262-3441.

22-24 6th Annual Trauma and Critical Care Seminar; U of M; Hennepin County Medical Center; CONTACT: Donald M. Jacobs, HCMC, 701 S. Park, Minneapolis, MN 55415; 612/347-2810.

23-24 Advanced Trauma Life Support Course; American College of Surgeons State Committee on Trauma, UMD, and St. Luke's Hospital, Duluth, MN; CONTACT: Charles L. Barbee, M.D. ATLS Physician Course Director, 1000 First St., Duluth, MN 55805; 218/727-7259.

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Whether practicing on their own or as part of a clinic, the physicians have joined because physicians are the policymakers of the Exchange, the Exchange has a sound risk management program, the Exchange has a solid reinsurance program and the Exchange offers attractive rates.

For these reasons, we encourage you to give the Exchange your careful consideration. If you have any questions, desire additional information or would like to join the Exchange, please call 800/462-5326 or 612/623-1132.

Sincerely,



Robert S. Flom, M.D.
Chairman,
Minnesota Medical Management, Inc.

CME IN MINNESOTA

(September continued)

26-28 Clinical Microbiology Reviews; Mayo Clinic, Rochester; CONTACT: Postgraduate Courses, Mayo Clinic, 200 1st Street S.W., Rochester, MN 55905; 507/284-2085.

28-30 Obstetrics & Gynecology; U of M: Holiday Inn, Nicollet Mall, Minneapolis; CONTACT: CME, U of M Box 293 Mayo Memorial Bldg., 420 Delaware Street S.E., Mpls. MN 55455; 612/373-8012.

30 Northwestern Pediatric Society Annual Meeting; Chanhassen; CONTACT: Frederic Kleinberg, M.D., Mayo Clinic Rochester, MN 55905; 507/284-2922

September 30-October 1 Vascular Disease; Methodist Hospital and St. Louis Park Medical Center Research Foundation; Radisson South; CONTACT: Elaine Anderson, Assistant Director of Medical Education, 5000 W. 39th Street, Minneapolis, MN 55416; 612/927-3703.

October, 1983

5-7 Internal Medicine Review (10th Annual Course); U of M, Mayo Memorial Auditorium CONTACT: CME, U of M, Box 293 Mayo Memorial Building, 420 Delaware Street, S.E., Minneapolis, MN 55455; 612/373-8012

5, 11, 12 Basic Life Support Instructor Program; Methodist Hospital; Methodist Hospital; CONTACT: Mary Ann Kempcke, Methodist Hospital, 6500 Excelsior Blvd., P.O. Box 650, Minneapolis, MN 55440; 612/932-5167.

8 Current Trend in Ophthalmology — 7th Annual; Mount Sinai Hospital, Minneapolis; CONTACT: Evelyn Peterson, Medical Staff Office, Mount Sinai Hospital, 2215 Park Avenue, Minneapolis, MN 55404; 612/871-3700 ext. 1117.

12-15 Principles of Colon & Rectal Surgery; U of M; Mayo Memorial Auditorium, U of M; Mayo Memorial Auditorium, U of M; CONTACT: CME, U of M, Box 293 Mayo Memorial Building, 420 Delaware Street, SE, Minneapolis, MN 55455; 612/373-8012.

13-22 Advanced Cardiac Life Support Course; Methodist Hospital; Methodist Hospital; CONTACT: Joan Peterson, M.D. Methodist Hospital, 6500 Excelsior Blvd., P.O. Box 650, Minneapolis, MN 55440; 612/932-5419.

14 Cardiovascular Disease; U of M; CONTACT: CME, U of M, Box 293 Mayo Memorial Building, 420 Delaware St., S.E., Minneapolis, MN 55455; 612/373-8012.

14-15 5th Adolescent Medicine & Health Conference; U of M; Earle Brown Center, U of M; CONTACT: CME, U of M, Box 293 Mayo Memorial Building, 420 Delaware Street, S.E., Minneapolis, MN 55455; 612/373-8012.

14-16 Midwest Allergy Forum; Minnesota Allergy Society, Hyatt Regency, Minneapolis; CONTACT: Dr. Paul Steinberg, 5000 W. 39th Street, Minneapolis, MN 55416; 612/297-3091.

15 Annual Meeting of MN Chapter of American College of Physicians; Hyatt Regency, Minneapolis; CONTACT: Tom G. Bergstrom, M.D., 750 South Broadway, Cokato, MN 55321.

17-19 Recent Advances in Cardiac Catheterization; Mayo Clinic; Rochester; CONTACT: Postgraduate Courses, Mayo Clinic, 200 1st St. S.W., Rochester, MN 55905. 507/284-2085.

18 Antibiotic Update; Central Mesabi Medical Center; Central Mesabi Medical Center; CONTACT: Ben P. Owens, M.D., Mesaba Clinic, Hibbing, MN 55746; 218/262-3441.

19-21 Second Annual Course; Emergency Medicine for Primary Care Physicians; St. Paul-Ramsey Medical Center; St. Paul Hotel; CONTACT: Ruth McIntyre, St. Paul-Ramsey Medical Center, 650 Jackson Street, St. Paul, MN 55101; 612/221-3992.

20-22 17th Annual Orthopedic and Trauma Seminar; Hennepin County Medical Center; Hennepin County Medical Center — Pillsbury Auditorium; CONTACT: Ramon B. Gustilo, M.D., 701 Park Avenue South, HCMC Orthopedic Office 813, Minneapolis, MN 55415; 612/347-2812.

21-22 Annual Meeting of MN Society of Neuro Sciences; Minneapolis; CONTACT: Lawrence Schut, M.D., 4225 Golden Valley Road, Minneapolis, MN 55422; 612/588-0661.

23 Update in Cardiology; Mayo Clinic; Rochester; CONTACT: Postgraduate Courses, Mayo Clinic, 200 1st Street S.W., Rochester, MN 55905; 507/284-2085.

24-26 Clinical Reviews; Mayo Clinic; Rochester; CONTACT: Postgraduate Courses, Mayo Clinic, 200 1st Street, S.W., Rochester, MN 55905; 507/284-2085.

27-28 Medical Management of Disability Claims; U of M; Radisson South, Bloomington; CONTACT: CME, U of M, Box 293, Mayo Memorial Building, 420 Delaware Street, S.E., Minneapolis, MN 55455; 612/373-8012.

November, 1983

3 John I. Coe Symposium — Computers in Anatomic Pathology and Newer Immunodiagnostic Techniques; U of M; Hennepin County Medical Center; CONTACT: John T. Crosson, M.D., 701 Park Avenue, Minneapolis, MN 55447; 612/347/3010

3-4 Society of Shoulder & Elbow Surgeons; Mayo Clinic, Rochester; Postgraduate Courses, Mayo Clinic, 200 1st Street S.W., Rochester, MN 55905; 507/284-2085.

4 Head & Neck Pathology — E. T. Bell Annual Pathology Symposium; U of M, Minneapolis; CONTACT: CME, U of M, Box 293 Mayo Memorial Building, 420 Delaware St. S.E., Minneapolis, MN 55455; 612/373-8012.

4 Semi-Annual Meeting, MN Surgical Society; Minneapolis, MN; CONTACT: Charles L. Barbee, M.D., 1000 E. 1st St., Ste. 203, Duluth, MN 55805; 218/727-7259.

For further information on *future* CME programs, contact Department of Education & Specialty Affairs, Minnesota Medical Association, 2221 University Ave. SE, Suite 400, Minneapolis, MN 55414, 612/378-1875.

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SPONSORS: Minnesota Academy of Family Physicians
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Minnesota Medical Association
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DATES: Saturday, September 10, 1983 (Hematology - Urine Cultures - How to Process Specimens for the Minnesota Department of Health)
Saturday, October 22, 1983 (Microbiology - Urinalysis)

LOCATION: University of Minnesota, Minneapolis

FOR FURTHER INFORMATION: Pat Solberg, Workshop Coordinator
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Minnesota Academy of Family Physicians
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Minneapolis, Minnesota 55414
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The Total Hip: Current Status — July 28-30, 1983

Hyatt Regency Minneapolis, Minneapolis, Minnesota

Fee: \$350

Credit: 17, Category 1 AMA

This course will examine the basic science of mechanical failure of hip replacement, clinical presentation of failure, infection in total hip replacement, revision surgery, and new techniques in primary hip replacement.

The Fourth Biennial Leadbetter Symposium — Urolithiasis: Biochemical, Metabolic, and Surgical Aspects — August 18-20, 1983

Wiley Hall, University of Minnesota, Minneapolis

Fee: \$350

Credit: 23, Category 1 AMA

Fee: \$600 Team registration

Fee: (Urologist & Nephrologist)

Coverage of the major selected topics in urolithiasis will be comprehensive and authoritative.

Radiology/83: Special Imaging Including Computed Tomography, Ultrasound and Digital Angiography — September 12-16, 1983

Wiley Hall, University of Minnesota, Minneapolis

Fee: \$400

Credit: 28, Category 1 AMA

This five-day, comprehensive review will emphasize the newer imaging modalities including computed tomography, ultrasound and digital angiography, interventional radiology as it applies to the general radiologist, and will provide an introduction to nuclear magnetic resonance.

For further information please contact: Continuing Medical Education, Box 293 Mayo Memorial Building, 420 Delaware Street, SE, Minneapolis, MN 55455, (612) 373-8012.

Development of Term "Senility" as a Medical Diagnosis — Halpert (page 424)

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|--|--|
| <p>18. Maudsley, Henry: The pathology of the mind. London, 1880.</p> <p>19. Nascher, Isaac L: Geriatrics: The diseases of old age and their treatment. Philadelphia: P. Blakistan's Son and Co., 1914.</p> <p>20. National Institute on Aging: Senility Reconsidered. The Journal of the American Medical Association 244:3:259-263, 1980.</p> <p>21. National Institute of Mental Health. Additions and resident patients at end of year, state and county mental hospitals by age and diagnosis, by state and DHEW region. United States, 1974. Rockville, MD, December, 1976.</p> <p>22. Paleotti, Gabriele: De bono senectutis (1595). Excerpt translated by Karl Stein and Thomas Cassirer in: A gerontological treatise of the Renaissance. American Journal of Psychiatry 102:770-773, 1946.</p> <p>23. Pinel, Philippe: A treatise on insanity. London, 1806.</p> <p>24. Prichard, James Cowles: A treatise on insanity and other disorders of the mind. London, 1837.</p> | <p>25. Rush, Benjamin: Medical inquiries and observations on diseases of the mind. Philadelphia, 1812.</p> <p>26. Seidel, A: Diseases of old age. In: Woods Medical and Surgical Monograph 5:631-665, New York, 1890.</p> <p>27. Sprenger, Jacob; Kramer, Heinrich. Malleus maleficarum. 1489</p> <p>28. Theoharides, Theoharis C: Galen on Marasmus. Journal of the History of Medicine and Allied Sciences 26:369-390, 1971.</p> <p>29. Thewlis, Malford W: Geriatrics: A treatise on senile conditions, diseases of advanced life and care of the aged. St. Louis: C. V. Mosby Co., 1919</p> <p>30. Tuke, D. Hack: A dictionary of psychological medicine. London, 1892.</p> <p>31. Zilboorg, Gregory: A history of medical psychology. New York: W. W. Norton and Company, Inc., 1941.</p> |
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Placement of ads by telephone not accepted. We also reserve the right to decline or withdraw advertisements at our discretion. Every care is taken to avoid mistakes but responsibility cannot be accepted for clerical or printers errors.

Cancellation of ads must be made before the 10th of the preceding month's issue.

The Journal is not permitted to divulge the identity of advertisers who have replies sent to box numbers.

GENERAL SURGEON, board certified or eligible, to join 15 doctor multi-specialty clinic in New Ulm, 90 minutes from Twin City metro area. Group includes emergency medicine, family practice, internal medicine, obstetrics and gynecology, orthopedics, pediatrics and general surgery. Associates include oncology, otolaryngology, pathology, radiology and urology. Contact Harold Fenske, administrator, collect — (507) 354-4101.

FAMILY PHYSICIAN wanted for practice in rural Minnesota. Liberal buy in. Practice includes an office 20 miles from well-equipped modern 56 bed JCAH approved hospital. For more information, contact: James G. Lawson, Administrator, Tri-County Hospital, Inc., 418 N. Jefferson, Wadena MN 56482, call collect (218) 631-3510.

OPPORTUNITY FOR qualified physicians at the Albert Lea Clinic, P. A., in Albert Lea, Minnesota. The clinic is a seventeen man multi-specialty group in primary and secondary care fields. The financial rewards are exceptional and practice challenges very attractive. There is a negotiated salary at top level for the first year. Senior physician participation begins at the end of the first year with a incentive income distribution plan plus expanded fringe benefits. The clinic has a low cost buy in with a maximum profit sharing plan. There is a top level insurance program, medical reimbursement program, and a full range of other benefits. A nearly new hospital in the city provides an exceptional place to work. These are choice practices in a delightful place to live. We are currently looking for physicians in general orthopedic medicine, in Otolaryngology, one OB-GYN. Please contact B. J. Boss, Administrator, Albert Lea Clinic, P. A., 1602 Fountain Street, Albert Lea, MN 56007. Phone 507-373-8251. Personal phone 507-377-1406 or contact L. E. Shelhamer, Jr., M.D., 507-373-8251 or personal phone 507-377-1530.

OFFICE SPACE FOR RENT: Physician in Loring Park area of Minneapolis wishes to rent part of his office to another Doctor. Six exam rooms, x-ray, lab, proctable, etc. Adjacent to hospital. Call 612-870-8448.

LA CROSSE, WI — NEONATOLOGIST needed to join 50-physician multispecialty clinic with four pediatricians/one neonatologist. Will be co-director of 14-bed, Level III, Regional Infant Intensive Care Unit in modern 350-bed hospital immediately adjacent to clinic. CT scanner and complete ultrasound available. Consultants available in neurosurgery, pediatric cardiology, neurology and surgery. Complete transport team with four neonatal nurse clinicians. La Crosse is a progressive, family-oriented city of 50,000 in the beautiful Mississippi River Valley with a medical referral area of greater than 200,000. Exceptional cultural, educational and recreational opportunities locally. Contact: P.S. Shultz, M.D., Medical Director, Skemp-Grandview-La Crosse-Clinic, 815 S. 10th St., La Crosse, WI 54601. Phone (608) 782-9760.

FAMILY PHYSICIAN FOR PROGRESSIVE RURAL MINNESOTA CLINIC. New and superbly-equipped facility. A pleasant farming community in a physician shortage area, yet only 25 minutes from a metro area. A comfortable call schedule at nearby hospital. Gateway to Minnesota's famous lake country. Young and growing practice with excellent salary and benefits, ownership potential. Must be board-eligible. Call or write to Mr. David A. Nelson or Faris Keeling, M.D. at 218-354-2111 or write to Barnesville Area Clinic, P.O. Box 521, Barnesville, MN 56514.

FAMILY PHYSICIAN to join well established primary care practice. Newly remodeled clinic attached to modern hospital. First year guaranteed plus benefits. Contact Dr. Larry Rapp, Medical Arts Clinic, Elbow Lake, Mn. 218-685-4406 or Russell Sauer — 218-685-5272.

Classified Advertisements

FAMILY PHYSICIAN, board eligible, to join group of six Board Certified Family Practitioners and one Board Certified General Surgeon in Blue Earth, Minnesota. \$45,000.00 plus incentive bonus first year with full membership after first year. 4,000 population with practice area of 25,000 in South Central Minnesota. Economy is stable agricultural plus small clean industries. Connected hospital and clinic enlargements now under construction. Complete ancillary support including anesthesiology, radiology, pathology, etc. Contact Marjeane Werner, Clinic Administrator or Dr. Thomas E. Watts, Business Phone: (507) 625-7371. Blue Earth Medical Center, Ltd., 520 South Galbraith, Blue Earth, MN 56013.

NEUROLOGIST Board certified/eligible for 45 physician multi-specialty group in rural Minnesota with large referral area. CT Scan (GE8800) in community hospital. Large local state hospital would welcome consultations. Stimulating professional opportunities along with good family living — excellent schools — many lakes. Liberal salary and fringe benefits. Interested contact Ronald Holmgren, M.D., Willmar Medical Center, Willmar, MN 56201.

FAMILY PRACTITIONER, ALLERGIST, AND INTERNIST-NEPHROLOGIST specialty positions available with Mankato Clinic, Ltd. Our 30 man multi-specialty group attracts specialty referrals from a southern Minnesota area of 200,000 population. Excellent group practice opportunity in All-American community with full hospital services; full range of group fringe benefits; liberal time off; salary first year; incentive pay thereafter. For more information call collect R. F. Roskens, Administrator, or Dr. B. C. Gregory, 507-625-1811.

FAMILY PRACTITIONER — Join an active practice in Northern Minnesota. Two young F.P.'s are looking for one or two associates to replace retiring partner. Attractive clinic and 44 bed hospital in a friendly town of 2000. Contact W. Ofstedal, M.D., 218-435-1212, Fosston, Minnesota 56542.

GROUP OR SOLO practice available in a northern Minnesota rural community. National forests, skiing, excellent fishing and hunting are easily accessible. Existing practice with building and equipment. Present physician averages 20-30 patients per day. Financial incentive package includes interview and relocation expenses, income guarantee, and paid CME leave and coverage. For additional information please call or write: Ernie Hawkins, Hospital Corporation of America, P.O. Box 1575 Nashville, TN 37202, 1-800-251-1537.

INTERNIST needed in Moorhead. Metro area 100,000. 3 Colleges. First Year Salary with full partnership after one year. Contact: John Gjevre, M.D., Moorhead Medical Center, Moorhead, MN 56560 (218) 236-8555.

GENERAL SURGEON: Tired of large city medicine? General Surgeon needed for Northern Minnesota resort area with 39 bed hospital, and drawing area of approximately 10,000. Write: Minnesota Medicine (733), 2221 University Ave., S.E., Suite 400, Minneapolis 55414.

INTERNIST, board certified/board eligible to join a soon to be vacated solo practice in Northfield, Minnesota. For an internist wishing to join a multi-specialty group and absorbing the current solo practice, this is also an option. Broad array diagnostic and clinical services provided locally and through specialties from the Twin Cities. Practice is established, stable, and with considerable potential. Two college community, excellent quality of life, short distance from Mayo Clinic as well. Call and send vitae to: Cliff Christiansen, Northfield City Hospital, 800 West Second Street, Northfield, Minnesota 55057 (Phone: 507-645-6661).

HISTORIC LOG CABIN, 3 bedroom with guest cabin, on breathtakingly beautiful LAKE SUPERIOR. Fireplaces, 600' of lakeshore with dramatic cliffs and woods. Lutsen, Minnesota. \$400.00 weekly. 920-7537 or 333-8361 (Jim).

(Continued on Page 458)

Classified Advertisements

(Continued from page 457)

OB GYN to join successful 12 physician practice in Faribault, MN, just 50 miles south of Mpls. on 35 W. 2 general surgeons, 2 internists, 8 family physicians. Busy OB practice. Newly remodeled clinic 5 blocks from modern well-equipped hospital. Guaranteed salary first year, incentive compensation thereafter. Disability, Life, Health, Malpractice insurance paid by the clinic. Profit sharing and pension plan as well as generous vacation and study time. Contact Darral Mischke, Administrator, Faribault Clinic, Ltd., 924 N.E. 1st St., Faribault, MN 55021. Telephone: 507-334-3921.

ORTHOPEDIC SURGEON Join the medical care delivery system of the future, today. SHARE Health Care Associates, P.A., a physician-owned, prepaid multi-specialty group practice in Minneapolis/St. Paul is now recruiting Board Eligible/Board Certified orthopedic surgeons. Send C. V. with three references to Paul Kuhnmuensch, M.D., SHARE Health Plan, 555 Simpson Street, St. Paul, MN 55104.

MEDICAL DIRECTOR. community clinic in N.E. Mpls. Full-time outpatient general practice with emphasis on prevention and health education. Administrative skills, experience and interest in community medicine necessary. Salary negotiable. Start September, 1983. Send resume to: Dr. Nancy Richardson, Beltrami Health Center, 938 Lowry N.E., Mpls., MN. 55418, or call 612-781-4078.

INTERNIST: Board qualified or certified with subspecialty training in cardiology to join solo internist. Call or write: R. LAWRENCE THIENES, MD, BOX 1161, ST. CLOUD, MN 56301, (612) 252-7790.

STAFF PSYCHIATRIST CMHC has an excellent opportunity for a staff psychiatrist. Must be board eligible. Programs include in-patient, out-patient, education and consultation, specialized services to children, the chronically mentally ill, and the chemically dependent delivered in conjunction with a seasoned team of multi-disciplinary mental health professionals including two part-time psychiatrists. Excellent four-season recreational area. Salary and fringe benefits negotiable. Contact: Donald E. Frees, ACSW, Area Program Director, P.O. Box 646, Bemidji, MN 56601. An Equal Opportunity Employer.

LOCUM AVAILABLE. Two experienced MDs. good experience in FP/OB/ER. Call Lucky 1-612-424-5494 evenings or weekends.

TWO RESIDENCY-TRAINED FAMILY PHYSICIANS are needed to expand an established family practice in Tomah, Wisconsin (population 7,000). The current physician in the practice (who is ABFP certified) wants to reduce his high patient volume and incorporate more elements of contemporary family medicine into the practice. The principal attributes of this opportunity are good professional support, an attractive and equitable compensation package, good prospects for further recruitment, a viable 79-bed local hospital, a growing community, tremendous recreational resources, and a formal association with a 50-physician multispecialty group. Practice family medicine the way you've been trained and without constraints from other primary care specialists. Contact: P.S. Shultz, M.D., Medical Director, Skemp-Grandview — La Crosse Clinic, 815 S. 10th St., La Crosse, WI 54601. Phone (608) 782-9760.

WANTED: Ob-Gyn, family practitioner, and pediatrician to join multi-specialty group. One month vacation, hunting, fishing and lake recreation area. Starting salary excellent, many fringe benefits included. Write: MINNESOTA MEDICINE (731), 2221 University Ave. SE, Suite 400, Minneapolis 55414.

MEDICAL OFFICE SPACE for rent: Heart of downtown Minneapolis. Physicians in Medical Arts Building, 825 Nicollet Mall wish to sublet their facilities to another physician on a part-time basis. Call (612) 332-5316.

GENERAL SURGEON AND/OR OB/GYN SURGEON to join 10 doctor multi-specialty group in Owatonna, a community of 18,500 located 68 miles south of the Twin Cities and 42 west of Rochester. Present staff consists of 7 family practitioners, 2 internists, and 1 general surgeon. Other specialties in the community and a close working relationship with the Mayo Clinic, the University of Minnesota hospitals, and other metropolitan centers provide for excellent consultations. Guaranteed salary first year with incentive program thereafter. Group Health, disability, life and accident insurance, retirement profit sharing, and automobiles provided by corporation. Contact: J. D. Miller, M.D. or James Wilkus, Administrator, Owatonna Clinic, P.A., 134 Southview, Owatonna, MN 55060. Telephone (507) 451-1120.

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MEDICAL DOCTOR to become Associate Chief of Medicine for Intermediate Medicine. Prefer Board Eligible/Board Certified in internal medicine with background or formal training in geriatrics. Position offers: a competitive salary, a 40-hour week, malpractice coverage, 30 days paid vacation, and other excellent fringe benefits, in a JCAH accredited progressive medical center having a large patient population, adequate staffing, including Physician Assistants and research opportunities. Financial assistance to defer cost of relocation. Equal Opportunity Employer. Write or call Personnel Service, Veterans Administration Medical Center, St. Cloud, Minnesota 56301, (612) 252-1670.

DERMATOLOGIST, Board certified/eligible to join progressive multi-specialty group of 40+ physicians. Pleasant growing community. Many outdoor recreational opportunities. High quality of life. Referral area, 150,000. Liberal financial benefits. Send curriculum vitae and references, ATTN: T. A. Breen, M.D., 101 Willmar Avenue, Willmar, MN 56201.

WANTED: Part-time position in clinical work or in medically related area for young hard working licensed female physician. No board certification in a medical specialty. Position must be located in the Twin Cities. Write or call Carole Bolles MD, 6701 Apache Rd, Edina, MN 55435. Phone 612-941-6665

PSYCHIATRIST to join progressive multi-specialty group of 40+ physicians. Pleasant, growing community. Many outdoor recreational opportunities. High quality of life. Referral area: 150,000. Liberal financial benefits. Send curriculum vitae and references to ATTN: T. A. Breen, M.D., 101 Willmar Avenue, Willmar, MN 56201.

3 TO 4 FAMILY Practitioners needed to staff 3 satellites of a 34 physician multispecialty group in beautiful small communities in east-central Wisconsin. Attractive income arrangements, association membership possible after one year, pension and profit sharing, extensive fringe benefits. Contact R. B. Windsor, M.D., 1011 North 8 Street, Sheboygan, WI 53081: phone 414/457-4461.

PSYCHIATRIST — Immediate opening for staff psychiatrist at publicly funded Community Mental Health Center serving population of 45,000. Usual outpatient duties with adolescents and adults plus Medical Director of new 12-bed inpatient unit. Center has interdisciplinary staff of 14, including full time psychiatrist; programs include outpatient services, inpatient, EAP, CDOP, Victim Crisis Center, and day care for chronic MI. Salary range \$60-75,000 with excellent benefits including fully paid family health insurance, moving allowance, good retirement plan and paid malpractice. Good family town (but cold winters) two hours from Minneapolis, 40 minutes from Mayo Clinic. Minnesota license required. Please contact Lawrence R. Maier, Ph.D., P.O. Box 396, Austin, MN 55912 or call collect (507) 433-7389. Complete vita and references needed.

OB/GYN SPECIALISTS. Enjoy the security of group practice with the freedom of independent practice. If you are Board Certified or Board Eligible in OB/GYN, we have an interesting opportunity for you. Two specialists are needed immediately to form an independent OB/GYN practice in a very desirable Northern Wisconsin community with a drawing population of 70,000. Active practice assured. All major specialists available for consultation. Business and technical advice will be provided. Outstanding personal benefit programs available. Good income potential. New 35 million dollar hospital. For further information write: Administrator, P.O. Box 1646, Wausau, Wisconsin 54401.

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(Continued on page 460)

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(Continued from page 459)

OFFICE SPACE FOR RENT: Former O.B. G.Y.N. suite in Capitol Medical Office Building attached to Bethesda Lutheran Medical Center in St. Paul. 3,589 sq. ft. includes reception area, 10 exam rooms, lab area, doctors' lounge, nurses' lounge, and 2 private offices. Ready for equipment and patients. Suitable for a variety of practices. Space can be subdivided. Call Dick Keller at Kraus-Anderson (612) 332-1241.

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FELLOWSHIP IN ALCOHOL-DRUG Dependence, one year, University of Minnesota. Contact Dr. Joseph Westermeyer, Box 393 Mayo Bldg., University of Minn. Hospitals, Minneapolis, MN 55455 for further information. (612) 373-8102.

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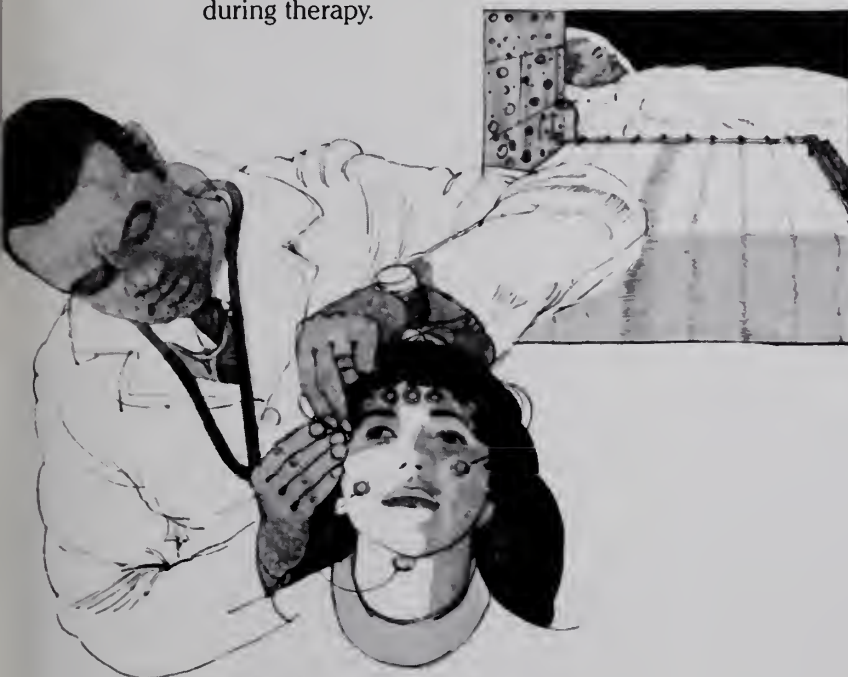
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References: 1. Kales A et al: *J Clin Pharmacol* 17:207-213, Apr 1977 and data on file, Hoffmann-La Roche Inc., Nutley, NJ. 2. Kales A: Data on file, Hoffmann-La Roche Inc., Nutley, NJ. 3. Zimmerman AM: *Curr Ther Res* 13:18-22, Jan 1971. 4. Kales A et al: *JAMA* 241:1692-1695, Apr 20, 1979. 5. Kales A, Scharf MB, Kales JD: *Science* 201:1039-1041, Sep 15, 1978. 6. Kales A et al: *Clin Pharmacol Ther* 19:576-583, May 1976. 7. Kales A, Kales JD: *Pharmacol Physicians* 4:1-6, Sep 1970. 8. Frost JD Jr, DeLucchi MR: *J Am Geriatr Soc* 27:541-546, Dec 1979. 9. Dement WC et al: *Behav Med* 5:25-31, Oct 1978. 10. Vogel GW: Data on file, Hoffmann-La Roche Inc., Nutley, NJ. 11. Karacan I, Williams RL, Smith JR: The

sleep laboratory in the investigation of sleep and sleep disturbances. Scientific exhibit at the 124th annual meeting of the American Psychiatric Association, Washington, DC, May 3-7, 1971. 12. Pollak CP, McGregor PA, Weitzman ED: The effects of flurazepam on daytime sleep after acute sleep-wake cycle reversal. Presented at the 15th annual meeting of the Association for Psychophysiological Study of Sleep, Edinburgh, Scotland, June 30-July 4, 1975. 13. Data on file, Hoffmann-La Roche Inc., Nutley, NJ.

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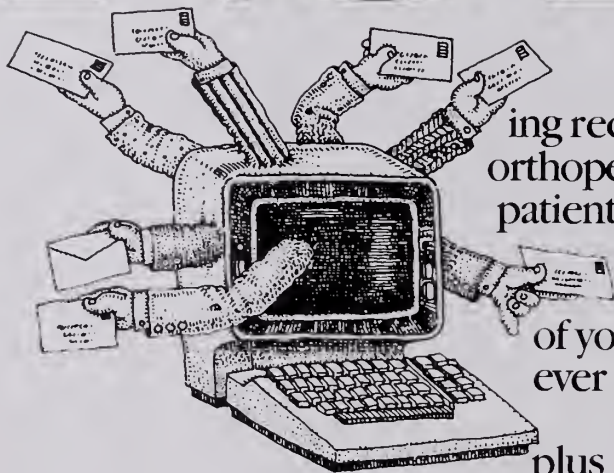
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August, 1983

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An added complication... in the treatment of bacterial bronchitis*

Increasing incidence
of ampicillin resistance in
Haemophilus influenzae

Ampicillin Resistant
Haemophilus influenzae

H. influenzae

S. pneumoniae

Some ampicillin-resistant strains of
Haemophilus influenzae—a recognized
complication of bacterial bronchitis*—are
sensitive to treatment with Ceflor.¹⁻⁶

In clinical trials, patients with bacterial bronchitis
due to susceptible strains of *Streptococcus*
pneumoniae, *H. influenzae*, *S. pyogenes*
(group A beta-hemolytic streptococci), or multiple
organisms achieved a satisfactory clinical
response with Ceflor.⁷

Ceflor®

cefadroxil

Pulvules®, 250 and 500 mg

hour. The effect on nursing infants is not known. Caution should be exercised when Ceflor® (cefadroxil, Lilly) is administered to a nursing woman.

Usage in Children—Safety and effectiveness of this product for use in infants less than one month of age have not been established.

Adverse Reactions: Adverse effects considered related to therapy with Ceflor are uncommon and are listed below.

Gastrointestinal symptoms occur in about 2.5 percent of patients and include diarrhea (1 in 70).

Symptoms of pseudomembranous colitis may appear either during or after antibiotic treatment. Nausea and vomiting have been reported rarely.

Hypersensitivity reactions have been reported in about 1.5 percent of patients and include morbilliform eruptions (1 in 100). Pruritus, urticaria, and positive Coombs' tests each occur in less than 1 in 200 patients. Cases of serum-sickness-like reactions (erythema multiforme or the above skin manifestations accompanied by arthritis/arthritis and, frequently, fever) have been reported. These reactions are apparently due to hypersensitivity and have usually occurred during or following a second course of therapy with Ceflor. Such reactions have been reported more frequently in children than in adults. Signs and symptoms usually occur a few days after initiation of therapy and subside within a few days after cessation of therapy. No serious sequelae have been reported. Antihistamines and corticosteroids appear to enhance resolution of the syndrome. Cases of anaphylaxis have been reported, half of which have occurred in patients with a history of penicillin allergy.

Other effects considered related to therapy included eosinophilia (1 in 50 patients) and genital pruritus or vaginitis (less than 1 in 100 patients).

Causal Relationship Uncertain—Transient abnormalities in clinical laboratory test results have been reported. Although they were of uncertain etiology, they are listed below to serve as alerting information for the physician.

Hepatic—Slight elevations of SGOT, SGPT, or alkaline phosphatase values (1 in 40).

Hematopoietic—Transient fluctuations in leukocyte count, predominantly lymphocytosis occurring in infants and young children (1 in 40).

Renal—Slight elevations in BUN or serum creatinine (less than 1 in 500) or abnormal urinalysis (less than 1 in 200).

[061782R]

*Many authorities attribute acute infectious exacerbation of chronic bronchitis to either *S. pneumoniae* or *H. influenzae*.

Note: Ceflor is contraindicated in patients with known allergy to the cephalosporins and should be given cautiously to penicillin-allergic patients.

Penicillin is the usual drug of choice in the treatment and prevention of streptococcal infections, including the prophylaxis of rheumatic fever. See prescribing information.

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the profession on request from
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Carolina, Puerto Rico 00630

300035

Brief Summary: Consult the package literature for prescribing information.

Indications and Usage: Ceflor® (cefadroxil, Lilly) is indicated in the treatment of the following infections when caused by susceptible strains of the designated microorganisms.

Lower respiratory infections, including pneumonia caused by *Streptococcus pneumoniae* (*Diplococcus pneumoniae*), *Haemophilus influenzae*, and *S. pyogenes* (group A beta-hemolytic streptococcus).

Appropriate culture and susceptibility studies should be performed to determine susceptibility of the causative organism to Ceflor.

Contraindications: Ceflor is contraindicated in patients with known allergy to the cephalosporin group of antibiotics.

Warnings: IN PENICILLIN-SENSITIVE PATIENTS, CEPHALOSPORIN ANTIBIOTICS SHOULD BE ADMINISTERED CAUTIOUSLY THERE IS CLINICAL AND LABORATORY EVIDENCE OF PARTIAL CROSS-ALLERGY OF THE PENICILLINS AND THE CEPHALOSPORINS. AND THERE ARE INSTANCES IN WHICH PATIENTS HAVE HAD REACTIONS, INCLUDING ANAPHYLAXIS, TO BOTH DRUG CLASSES.

Antibiotics, including Ceflor, should be administered cautiously to any patient who has demonstrated some form of allergy, particularly to drugs.

Pseudomembranous colitis has been reported with virtually all broad-spectrum antibiotics (including macrolides, semisynthetic penicillins, and cephalosporins); therefore, it is important to consider its diagnosis in patients who develop diarrhea in association with the use of antibiotics. Such colitis may range in severity from mild to life-threatening.

Treatment with broad-spectrum antibiotics alters the normal flora of the colon and may permit overgrowth of clostridia. Studies indicate that a toxin produced by *Clostridium difficile* is one primary cause of antibiotic-associated colitis.

Mild cases of pseudomembranous colitis usually respond to drug discontinuance alone. In moderate to severe cases, management should include sigmoidoscopy, appropriate bacteriologic studies, and fluid, electrolyte, and protein supplementation. When the colitis does not improve after the drug has been discontinued, or when it is severe, oral vancomycin is the drug of choice for antibiotic-associated pseudomembranous colitis produced by *C. difficile*. Other causes of colitis should be ruled out.

Precautions: **General Precautions**—If an allergic reaction to Ceflor occurs, the drug should be discontinued, and, if necessary, the patient should be treated with appropriate agents, e.g., pressor amines, antihistamines, or corticosteroids.

Prolonged use of Ceflor may result in the overgrowth of nonsusceptible organisms. Careful observation of the patient is essential. If superinfection occurs during therapy, appropriate measures should be taken.

Positive direct Coombs' tests have been reported during treatment with the cephalosporin antibiotics. In hematologic studies or in transfusion cross-matching procedures when antiglobulin tests are performed on the minor side or in Coombs' testing of newborns whose mothers have received cephalosporin antibiotics before parturition, it should be recognized that a positive Coombs' test may be due to the drug.

Ceflor should be administered with caution in the presence of markedly impaired renal function. Under such conditions, careful clinical observation and laboratory studies should be made because safe dosage may be lower than that usually recommended.

As a result of administration of Ceflor, a false-positive reaction for glucose in the urine may occur. This has been observed with Benedict's and Fehling's solutions and also with Clinistix® tablets but not with Tes-Tape® (Glucose Enzymatic Test Strip, USP, Lilly).

Broad-spectrum antibiotics should be prescribed with caution in individuals with a history of gastrointestinal disease, particularly colitis.

Usage in Pregnancy—**Pregnancy Category B**—Reproduction studies have been performed in mice and rats at doses up to 12 times the human dose and in ferrets given three times the maximum human dose and have revealed no evidence of impaired fertility or harm to the fetus due to Ceflor. There are, however, no adequate and well-controlled studies in pregnant women. Because animal reproduction studies are not always predictive of human response, this drug should be used during pregnancy only if clearly needed. **Nursing Mothers**—Small amounts of Ceflor have been detected in mother's milk following administration of single 500-mg doses. Average levels were 0.18, 0.20, 0.21, and 0.16 mcg/ml at two, three, four, and five hours respectively. Trace amounts were detected at one

President's Letter



Thank You, Bob Kelly

The medical-political career of Dr. Robert T. Kelly of Grand Rapids, Minnesota, took a sharp, unexpected turn on June 22, 1983, when Bob narrowly missed re-election to a second term as a trustee of the American Medical Association.

It is a partial measure of the man that, in the somewhat funeral-like atmosphere of a gathering of his supporters following the announcement of his defeat, his was the only voice which managed a chuckle now and then. This was noteworthy, because while for the rest of us this constituted a severe disappointment, keenly felt, for him it consisted of a sudden cancellation of plans and a change of orientation of significant proportions as well as a sense of personal rebuff. I would like to add to my own system of values the essence of his repeated admonition to those who sought to commiserate with him that "If you are going to run for office, you've got to be prepared for defeat." In a somewhat broader context this translates to mean "Risk of failure accompanies any difficult undertaking and is a part of the price to be paid for significant accomplishment."

It is for those knowledgeable in political matters to evaluate the reasons for his defeat, but it is a certainty that Bob did not constitute an example of the often repeated homily that a man will rise to the level of his incompetence. Dozens of statements made to the several members of the Minnesota delegation by his fellow trustees and others who have known him in his capacity as a trustee, both before and after the election, testified to the fact that Bob had done his job well, accomplished all he could with his opportunities and was a positive force for American medicine. There was some speculation that part of his problem may have been his unwillingness to avoid discussing difficult and divisive issues in his campaigning. Whatever the case, this defeat can in no way be a negative reflection on his performance of his job.

A complete list of the committee memberships, committee chairmanships and offices held by Bob Kelly in organized medicine's three level federation structure would occupy a good share of a page of this journal. Thirty-three line items pertaining to medicine were listed in his curriculum vitae for his recent campaign. This does not include items pertaining to his own education or honors which he has received. This gives evidence for a depth and intensity of devotion to the medical profession and its obligations to society that is probably unmatched by anyone in our area in recent times. This is not meant to discredit any of the countless physicians who have been devoted to the profession and to organized medicine.

During the past three years, Bob has traveled away from home for over 100 days per year. He has read and digested mountainous stacks of reports, spoken across the entire land wherever invited, been at the forefront of the JCAH controversy (being one of the JCAH commissioners), chaired a committee of the AMA board that accomplished its own reorganization, and maintained a direct line of communication with our Senators and Representatives that has been invaluable in our efforts to maintain a practice environment that will allow us to function with the freedom and flexibility that is so vital to our patient's needs.

A few weeks ago a call came during the night to Bob from Senator Durenberger. He wanted to discuss some medical-political issue soon to be considered in the Senate. The call found Bob at the hospital, and he was a long time coming to the phone. He explained to the Senator that he was in the process of delivering a baby in a taxi cab outside the ER door. "My God", said the Senator, "you guys really do those things don't you!" The Senator had brushed shoulders with grass roots medicine.

The saying goes that no one is irreplaceable, and at the AMA level, we must have confidence that some-

PRESIDENT'S LETTER

one as competent and devoted as Bob Kelly replaced him in the board of trustees. At the level of the MMA, however, there is no one who can bring to us the insight regarding national medical-political matters, and we will, indeed, be operating in the foreseeable future in a partial vacuum due to his absence from our meetings.

I began this piece with the statement that Robert T. Kelly's medical-political future took an unpredictable turn — not that it had ended. Bob Kelly is alive and well. We firmly believe and hope that we can continue to use his skill, experience, and enthusiasm in

state medical affairs for many years to come.

As President of the Minnesota Medical Association, I feel it is appropriate for me on this occasion to speak for all doctors in Minnesota and across the land when I say "Thank you, Bob Kelly! Thank you — and Godspeed in whatever new directions your remarkable talents and energy take you!"



Donald C. Bell, M.D.
President
Minnesota Medical Association

Weight Lifting Recommendations for Adolescents and Pre-adolescent Children*

- I. Since epiphyseal (growth plate) fractures do occur during power lifting (one R.M. (repetition maximum)).

and no documented evidence exists that power lifting improves sports performance or that conditioning and/or strengthening will strengthen epiphyseal (growth plate) bonds prior to puberty in adolescents and pre-adolescent children.

The Resource Group on Sports Medicine recommends that power lifting, one R.M., be avoided in adolescent strength training.

The recommended amount of weight to be lifted, pushed, pulled or squatted be no greater than 20 R.M. (The amount of weight lifted at least 20 times (approximately 50% to 60% of the amount) in one R.M.)).

- II. Since repetitive sports training and weight lifting can cause pain and injury to the juxta-articular apophyseal growth plates (i.e. Osgood Schlatters disease of the knee and Sever's disease of the heel)

and no demonstrably effective strengthening methods are available to prevent injury to apophyseal junctions (tendon origin growth plates),

Prepubertal boy and girl athletes should not perform athletics if performance, conditioning or weight training immediately aggravates the apophyseal (tendon) growth plates of the upper and lower extremities.

Resource Group on Sports Medicine
John W. Benton, M.D.
Chairman

*Endorsed by the Minnesota Medical Association at its Board of Trustee Meeting, July 16, 1983.



Editor's Notebook

The Truth about South Africa (as I see it)

JOHANNESBURG, SOUTH AFRICA — As I peer down on this city from my seventh floor hotel room, I find myself asking: is there any city in the United States that looks like Johannesburg? Well, maybe Denver. Denver is also booming and more than a mile high, but you see no mountains from Johannesburg. Or Dallas, also bustling, lusty, and confident. But while Dallas has its oil rigs, Johannesburg has its hundreds of pyramids of rocky debris from its gold mines. Minneapolis? Not really. Johannesburg is clean enough, but on this 80° February day, I cannot stretch my imagination enough to compare Minneapolis to Johannesburg. My point is this: Johannesburg's downtown could pass for that of any prosperous mid-American city.

The Land of South Africa

South Africa's interior plains most resemble Texas, Arizona, and Utah; its Eastern Province of Natal shares the climate of Florida; the old Boer Republics, the Orange Free State and the Transvaal, are treeless and featureless plains that mimic rolling parts of the Midwest; and the Cape Province, with its majestic meeting of mountains and sea at windswept Cape Point, evokes thoughts of Carmel and the California coast. This is a land of immense physical beauty. The whole country, set between the Atlantic and Indian Oceans, combines high central elevations with low southern latitudes, to produce the most agreeable climate in the world.

Personal Frustration

Yet after three weeks here, where I have been traveling with a group of revered physicians, I'm frustrated. I came to write a comprehensive article on South Africa and its Medicine. That article isn't going to come off. Not because I didn't cover enough ground or talk to enough people. I've traveled to Durban, Capetown, Pretoria, and Johannesburg; traversed the four Provinces — the Cape Province, Natal Province, the Orange Free State, and the Transvaal; seen rural "homelands" and sprawling urban "townships" where Blacks live; listened to South African academic physicians lecture; rode the Blue Train through the heart of this big country (twice as big as Texas;) made the requisite tours of gold and diamond mines; interviewed the Editor of the *South African Medical Journal*; and raided bookstores for any texts I could find on social, economic, and health conditions here.

The Races

But comprehensive this piece will not be. Why not? For two simple reasons: (1) You cannot learn enough about any country in three weeks to write anything "comprehensive", especially a country with as many diverse races as South Africa; and (2) I was traveling as a White man, viewing one side of the racial equation. The government divides peoples into four groups: (1) Whites, almost all of Dutch or English heritage; (2) Coloureds, offsprings of Hottentots, Mayans, and other slaves, and White settlers and sailors; (3) Asians, mostly of Indian background and concentrated in the Natal Province; and (4) indigenous Blacks, who come from multiple tribal groups and who have largely migrated from reserves to cities, creating tremendous political and social problems for the government.

The Whites

The Whites, who make up 16 percent of the population, dominate this country. Three-fifths of White South Africans are Afrikaans-speaking, Afrikaans being derived from the language of Holland, from where the earliest settlers came in 1652; two-fifths of the White people are primarily English speaking. Their forebearers arrived in the early 1800s. The Afrikaans speaking and English speaking Whites have a racial problem between them. They have had long and bitter struggles throughout the history of the country. The Nationalist Party, which has controlled the country since 1948, is composed overwhelmingly of Afrikaans-speaking Whites. They are morally and intellectually certain of the rightness of apartheid. The opposition party is mostly English-speaking, and its members are often morally uncertain about apartheid and tend to be intellectually cynical. Afrikaners and English have conflicting strains of behaviors and beliefs, and neither has ever triumphed completely over the other. They have agreed to disagree.

White Power

But they agree on power. Together the Whites own 87 percent of the land, dominate 98 percent of major businesses and industries, and take 66 percent of the disposable income. Whites rarely meet members of other groups, except as white employers and black employees. Whites live in different areas; attend different schools and churches; go to different hospitals and different sections of the same hospital; and are carried in different hearses to different cemeteries. South Africa is, in short, compartmentalized. On this trip, I didn't see much of the other three compartments.

Just the Facts

But I will have a go at explaining South Africa anyway. I shall start with the facts.

1. Area
 - a Including 10 homelands (larger than all States of Atlantic Coast Seaboard or nearly twice size of Texas) 472,359 square miles
 - b. Namibia-Southwest Africa (controlled by South African army) 317,827 square miles
2. Population

African (Black)	20,084,319	72%
White (60% of Afrikaners, 40% British)	4,453,273	16
Mixed (Coloured)	2,554,273	9
Asian (Indian)	794,369	3
	<hr/> 27,886,234	<hr/> 100
3. As of 1978

Blacks living in White Areas	10,998,700
Blacks living in Homelands	8,972,000
4. 1948-1978

Blacks forcibly removed from White Areas to Black Areas	2,108,000
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5. Average wage differentials

Manufacturing	4:1
Mining	6:1
6. Economy

GNP	\$85,000 billion
National Budget	18,000 billion
Inflation rate	14%
Prime rate	18%
7. Mineral wealth

Rank and Percent of Reserves

<u>Ore</u>		<u>Western World</u>		<u>Entire World</u>
Vanadium	1	90%	1	49%
Platinum	1	89	1	45
Chrome	1	84	1	81
Manganese	1	93	1	78
Gold	1	64	1	51
Diamonds	2	23	2	21
Uranium	2	18	3	5

8. Government

Republic of South Africa established in 1961 on basis of voting rights restricted to Whites. Four Provinces and ten Homelands

Blacks offered votes in homelands and resident townships located on White land. Four Homelands have been declared "independent"

Source "South African Perspectives". South African Fact Sheet (New York, New York, 1981)

The Beauty of South Africa

Facts don't give you the flavor of the physical majesty of this stunningly beautiful country. Its 18,000 plant species are the most varied in the World. The land falls from high central plateaus, and it does so in a scenic confusion of hills, valleys, and rivers. The Cape Province has its mountains and steep coast and wineries and Cape Dutch houses; the Orange Free State has its high velds guarded by purple mountains; the Transvaal has Johannesburg, which throbs above and below ground in its quest for gold, and Pretoria, the administrative capital, has 60,000 blooming jacaranda trees; and Natal, the Garden Province, has the warming Mozambique current which makes the land ripe for sugar cane, the water ideal for sharks, and the shops ready for tourists.

The Political "Situation"

Despite its beauty, politically this is the land of apartheid, or "separate development," or "multiple democracies," or simply "the situation". As one citizen says: "This is a beautiful country with beautiful people and stinking politics." To Europeans, it is the "Europe of Africa"; to Western industrialists, it is the "Saudia Arabia of Minerals"; to the Black leaders of Mozambique, Angola, Zimbabwe, and Namibia, it is "Fortress Africa"; to Western liberals, it is "the most racist nation on this planet"; and to its inhabitants, it is a land of such beauty they call it simply "beloved country."

American Tourists

Whatever South Africa is, it attracted nearly 10,000 American tourists in 1982. They came for the sunshine, the scenery, the foliage, the bargain prices, the hospitality, the action, the efficient accommodations, and such unique features as gold and diamond mines, game reserves, and the Blue Train, surely one of the most luxurious trains in the world.

The Sign of Truth

But what is the truth about South Africa? What is it *really like*, living here in an officially segregated society. I can only tell you what I see. Today, I saw this bilingual sign outside of a diamond mine.

O A place is in order when
R there are No unnecessary
D things about, and when
E all necessary things are
R in their proper places.
NO in this sentence
means NONE. NOT ANY.
NOT EVEN ONE.

Jou sekie is alleenlik in
orde wanneer daar geen
O onnodige goed rond le nie,
R en wanner alle nodige goed
D op hulle regte plekke is.
E GEEN in hierde sin bettern
NIKS, NIE IN PAAR GOED
NIE, SELFS NIE EERS EEN.

This sign tells you much about South Africa.

1. It tells you South Africa has two official languages (Blacks resent speaking Afrikaans, the language of their oppressors, and it is said that being forced to learn it was the main cause of the Soweto riots of 1976, in which at least 575 Blacks died).
2. It tells you that Whites demand order (as indeed they must in a controlled society in which a tiny minority has all the votes, own the best land, runs the police and army, and monopolizes the wealth).
3. It tells you the White rulers believe in separating "all necessary things" into "their proper places" (presumably these "things" include the other three races, who must live in separate places, go to separate schools and lead separate lives).
4. It tells you of the split between the Whites themselves, who demand both languages be used.
5. It tells you by its tone and message that this is a land of harsh and often arbitrary regulations (such as the Internal Security Act and the General Law Amendment Act,

which allows police to arrest and detain suspects without charges for 14 days; the Terrorism Act, under which arrests may be kept secret, suspects held indefinitely, and prisoners denied legal help; the Group Areas Act, which prohibits citizens from settling in other than specifically designated places; the Immortality Act, which forbids interracial sex and marriage; and the Bannings Act, under which banned individuals may not communicate with other banned persons and who may be confined to their residences.

Evolution of Racial Attitudes

But the sign doesn't tell you enough to understand the attitudes of this country's people, And how could it? In his widely read historical novel of South Africa, *The Covenant*, James Michener devoted 1235 pages to the shaping of this nation's mind, and South Africans say he just scratched the surface of their feelings towards each other.

But let me tell the story briefly. The Dutch first settled here in 1652 when Jan van Riebeeck and a small band of followers came onto the Cape for the Dutch East Indian Company. They met no natives and thus Whites claim Whites were the original inhabitants and are therefore founders of this country and not "colonists". White and Blacks did not meet until 1780, when the Dutch cattlemen moving east conflicted with Xhosa cattlemen moving south. In 1795, a British expeditionary force took over Capetown from the Dutch. The British bureaucracy so infuriated the Boers (the Dutch word for farmer), that the Boers gathered all their goods and people and animals and plunged into the uncharted interior. This was the Great Trek of 1835-1838. The Boers fought heat, fatigue, disease, wild animals, and Black tribes. They learned to rely on Bibles, on each other, on sheer will, and on their guns. When the Zulus tried to slaughter the Boers, or Voortrekkers, in 1836, the Boers added the Blacks to the British on their hate list.

But the British still regarded the Boers as their subjects. In 1843 they annexed Natal and in 1877 they took over the Transvaal, which just happened to have most of the diamonds in the world. In any event, the first Anglo-Boer War occurred in 1880, and in 1899 the second took place. The Boers won the first and lost the second and learned to hate the English even more, especially after 26,000 Boer men, women, and children died in British concentration camps. The Boers, or Afrikaners, as they are now called, never forgave the British or the Zulus (by far the largest of the black tribes of South Africa). The Boers bided their time, organized, kept to themselves, and when the time came in 1948, took over the government and have ruled since. The Nationalist Party introduced apartheid as their official policy. This policy remains intact today.

The Health System

And lastly, the sign doesn't tell you anything about the health system. The system, to begin with, is a mix of public health services, public subsidized hospitals and clinics, and private practice, often supplemented by government funds. The government claims its public health services cover all racial groups. It points with pride to the 2500 bed Baragwanath Hospital in Soweto and to the similarly sized King George V Hospital in Durban, both of which serve mostly Blacks.

I don't understand the payment scheme for Whites. But we were told coronary bypass at Groote Schuur Hospital, South Africa's leading academic center and the site of Christian Bernard's surgical unit, costs a mere \$565 (versus \$20,000 to \$25,000 in the U.S.). At Tygerberg Hospital, a 3000 bed Afrikaner complex outside Capetown, we noted White and Non-White units were mirror images of one another. Yet non-White units were crowded with patients, and White wards were virtually empty.

My impression was that private physicians do well. Reliable sources told me physicians average between \$60 and \$80 thousand in annual income. In Capetown, which struck me as a combination of Boston and San Francisco, I saw two gleaming, new, centrally located office buildings.

Health Statistics of Races

The government insists facilities are equal, but health statistics vary strikingly among Whites, Coloureds, Asians, and Africans. Infant mortality rates for Blacks between one and four years are ten times those of Whites. Black infants die mostly of malnutrition, or in their weakened state, succumb to gastroenteritis, measles, pneumonia, and diarrhea. Infant mortality rates per 1000 live births are 12 Whites, 64 urban Blacks and 240 rural Blacks (compare these figures to 160 in Zaire, 16 in the United Kingdom, 14 in the United States, and 9 in Sweden). Among Black adults, leading killers are gastroenteritis, hypertension, rheumatic fever, homicide, accidents, and alcoholism (the doctors here say the stopper is seldom put back on the bottle once drinking has started). South African Whites have one of the highest mortality rates in the world for coronary disease. Here is a Table from the *South African Medical Journal*, listing mortality figures per 100,000

	Whites	Asians	Coloured	Blacks
All causes of death	403	754	801	826
Circulatory diseases	167	363	329	240
Rheumatic heart diseases	6	11	18	12
Hypertension	7	58	48	41
Ischemic heart disease	73	119	64	12
Other heart disease	11	31	47	66
CVA	43	134	131	92

Source: Wyndham, C H. Trends of cardiovascular mortality rates in the populations of the RSA for period 1968-1977. *South African Medical Journal*. 61:987-992, 1982

Number and Location of Doctors

Part of the disparity in health outcomes may be due to where patients live and the doctors practice. Rural Blacks have a hard time getting to doctors or hospitals. In rural areas, one doctor serves every 40,000 Blacks (versus one for every 600 Whites in the cities). In South Africa, 85 percent of doctors are White, 8 percent Asian, 3 percent Coloured, and 3 percent Black. Among Black physicians, 81 percent live in the cities.

Health and Socio-economic Conditions

None of this should come as any surprise. The health of any society rarely rises above its economic conditions. This can be easily seen in the following Table, which shows the differences between the western industrialized countries and the developing countries.

Health-Related Indicators in Countries with Different Income Levels.⁶

Indicator	Year	Low-Income Countries*	Middle-Income Countries†	Industrialized Countries‡
Gross national product per capita (\$)	1979	240	1420	9440
Crude birth rate (births/1000 population)	1979	42	34	15
Crude death rate (deaths/1000 population)	1979	16	10	10
Life expectancy at birth (yr)	1979	51	61	74
Infant mortality rate (deaths/1000 live births)§	1978	(49-237)	(12-157)	13
Child mortality rate (deaths/1000 children 1-4 yr old)	1979	18	10	1
Per cent of population	1975	25	58	¶
Daily per capita calorie supply (% of requirement)	1977	96	109	131
Adult literacy rate (%)	1976	43	72	99

*Thirty-four low-income developing countries with per capita income of \$370 or less in 1979 (China and India are excluded from the low-income group in this table).

†Sixty middle-income developing countries with a per capita income of more than \$370 in 1979.

‡Eighteen industrial-market economies.

§Weighted averages; figures in parentheses denote the sample range.

¶Data not available but assumed to be close to 100 per cent.

||Requirements based on calories needed to sustain a person at normal levels of activity and health, taking into account age and sex distributions, average body weights, and environmental temperatures, as estimated by the United Nations Food and Agriculture Organization.

SOURCE: Evans, J.R. et al.: Shattock lecture — health care in the developing world; problems of scarcity and choice *N Eng J Med* 305:1117-1127, 1981.

EDITOR'S NOTEBOOK

At its best, medical care in South Africa Whites equals anything in the West; and at its worst, the care resembles conditions in other developing countries. Clearly, health and wealth are linked.

Meeting with Editor

Before I close, a word or two about my meeting with S.S.B. Gilder, T.D., M.B., B.S., B.Sc, Chief Editor of the *South African Medical Journal*, published in Capetown. Doctor Gilder, a cultured English gentleman of 75 or so with a shock of white hair and thick glasses, has previously been an editor for the *British Medical Journal*, Chief Editor of the *Canadian Medical Journal*, and was offered the editorship of the *Journal of the American Medical Association*, a position he turned down when his wife persuaded him to return with her to her native South Africa. He said he found South Africa a delightful place to live, with an ideal climate, a high standard of living, readily available domestic help, and an invigorating intellectual climate.

Perspective on South Africa

You can condemn South Africa, but you cannot ignore her. Her strategic location (more than 24,000 oil tankers round the Cape of Good Hope each year) and her wealth of vital minerals for western industrial countries make that impossible.

Although South Africa is the last outpost of white supremacy, her Blacks have the greatest life expectancy, the highest income, and best living conditions among Blacks on the African continent. In Africa, Black leaders often treat their own Black subjects more oppressively and brutally than the South African Whites treat their Black citizens.

The Black-White landscape is changing fast: in 1975-1976 Black riots in Soweto and other cities resulted in 600 deaths; in the same years, Black regimes assumed control of Mozambique and Angola; in 1980 Zimbabwe (previously Rhodesia) became Black-controlled and independent. Black governed countries now line South Africa's entire northern border, making South Africa vulnerable to any of her immediate northern neighbors.

Conclusion

You hear South Africa will "inevitably" fall to Blacks because she is ostracized and isolated, because her policies are morally repugnant, and because the Blacks double their numbers twice as fast as Whites.

True, but I would not write off organizational skills, military power, economic strength, and social discipline of the White South Africans. These Whites fervently believe in their cause, regard themselves as founders rather than colonists, and are prepared to go to extreme lengths to retain their position and power.

That may not be the way it ought to be, but that's how I see it. Time may be running out, but time is running out exceedingly slowly.

Richard L. Reese MD

Hand Surgery

THIS SPECIAL ISSUE of MINNESOTA MEDICINE is devoted to hand surgery and has been compiled by members of the American Society for Surgery of the Hand in Minnesota.

The articles in this issue are intended to give a sampling of the scope of hand surgery. One of the primary goals of the ASSH is education which we believe will improve the quality of care of the upper extremity.

We hope that interest from all levels of care, from the primary physicians to the surgeons and specialists in orthopedics and plastic surgery, will continue.

Special thanks to Dr. James House for his assistance.

Members of the American Society for Surgery of the Hand in Minnesota, include:

Doctors: James H. House
Elmer R. Salovich
Allen L. VanBeek
Lowell H. Kleven
Edward C. McElfresh
Wayne W. Thompson
Chris P. Tountas
Charles J. MacDonald
William H. Call
Richard S. Bryan
Edward H. Henderson
Michael B. Wood
William P. Cooney
Robert D. Beckenbaugh
James H. Dobyns
Ronald L. Linscheid

We would like to thank Dr. Elaine Nye and Dr. Richard Reece for the opportunity of putting this special issue together.

Chris P. Tountas, M.D.
Charles J. MacDonald, M.D.
Guest Editors

Cover Photo "Superior Majesty"

Dr. Richard N. Hadley, an orthopedist at the Nicollet Clinic, Minneapolis, took the cover photo along the North Shore of Lake Superior, just north of Lutsen. This is the area where he and his family visit at least once a year during the summer. Dr. Hadley told the editors that this part of the state is truly a photographer's paradise.

Dr. Hadley has had two previous photos on the covers of MINNESOTA MEDICINE, one on the September, 1979 issue "Autumn in Wisconsin" and the other, December, 1981 "Winter Elegance."

The "Winter Elegance" cover has been enlarged, and it hangs on the reception room wall of the Minnesota Medical Association.

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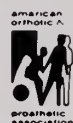


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Editorial

The Hand

Richard J. Smith, M.D.*
Immediate Past President
American Society for Surgery of the Hand

In 1833 Sir Charles Bell published "The Hand. Its Mechanism and Vital Endowments as Evincing Design." In a detailed anatomical and functional analysis of the hand, he extolled its exquisite form and versatility — proof, he concluded, of the work of a divine Creator. (Darwin's "Origin of the Species" would raise some doubts about this premise twenty-five years later.) In the decades which followed the publication of Bell's treatise, Jones, Kanaval, Barsky, Hilgenfeldt and others focused their attention on the hand as well, with books on anatomy, infections and reconstructive surgery.

However, it was not until the Second World War that surgery of the hand emerged as a recognized subspecialty. In four years of war, 89,000 American Army personnel suffered serious hand injuries. To successfully treat these men and women proved a major medical problem. Hand surgery centers were organized throughout the country and teams of surgeons and therapists soon became skilled in preserving and restoring hand function. Orthopaedic, plastic and general surgeons pooled their knowledge and experience and by their therapeutic success, they proved the value of an interdisciplinary approach to hand surgery.

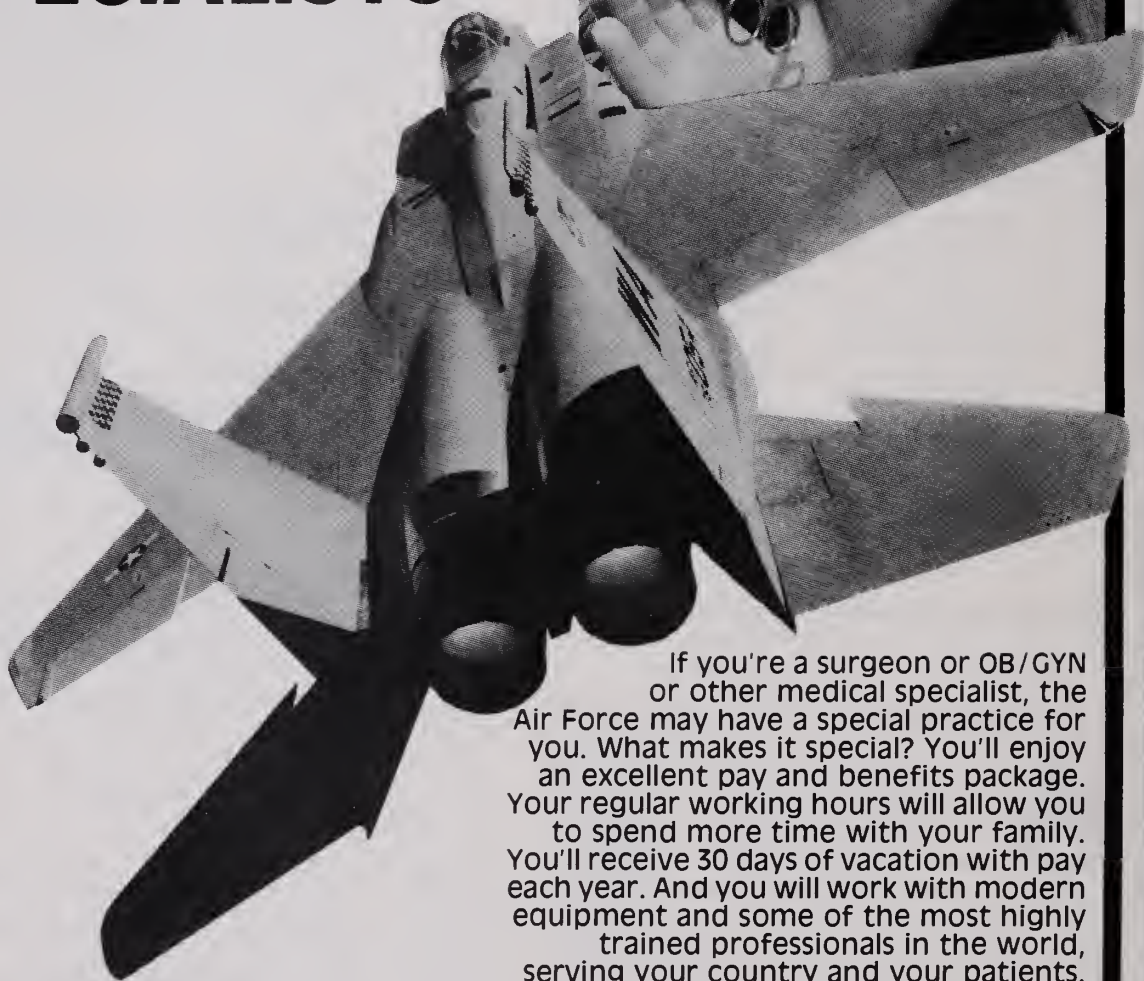
After the war, this experience was not to be squandered. Under the leadership of Dr. Sterling Bunnell of San Francisco, the American Society for Surgery of the Hand was founded in 1946. In the years which followed, other similar societies formed in the United States and throughout the world. The hand surgeon no longer was exclusively concerned with trauma. His attention was also directed to the care of the patient with a hand deformed or disabled by arthritis, congenital defects, tumor or neurological disease. Inevitably, many hand surgeons became interested in basic science. They have contributed considerably to our understanding of tendon healing, scar formation, kinesiology and pathomechanics.

As interest and knowledge in hand surgery has expanded, so have the educational activities of the American Society for Surgery of the Hand. In 1946, there were 35 members. Now there are over 650. In its first year, the educational activities of the Society consisted of one scientific meeting. This year the Society's educational achievements include organizing and administering an annual meeting, many instructional courses, review courses, continuing education symposia and surgical workshops, an active videotape rental library, a self-assessment examination, a bimonthly journal and the sponsorship of several research seed grants. On November 6, 1982, the American Society for Surgery of the Hand and the Bunnell Memorial Committee established the first Library and Museum dedicated to hand surgery. During the past six years the Society has reviewed over thirty fellowship programs in our country. The information obtained by these voluntary evaluations will no doubt be of great value both to prospective fellows in hand surgery and to those interested in educating future hand surgeons.

Hand injuries and deformities in our country resulted in a cost of ten billion dollars in wages and medical expenses in 1978. The few hundred hand surgeons who concentrate their practice in hand surgery cannot possibly treat all these patients. Nor should they. Hand surgery is an active field. Its problems and challenges require the attention of all medical personnel including the primary care physicians and pediatricians as well as the surgeons and the therapists. Although the hand surgeon may wish to restrict his practice to his field, he welcomes the opportunity to discuss his problems with his colleagues. We therefore are grateful to *Minnesota Medicine* for dedicating this issue to hand surgery. We hope it appropriately will reflect some of the work we are doing, the lessons we have learned, and the difficulties we still encounter.

*Clinical Professor, Orthopaedic Surgery, Harvard Medical School.

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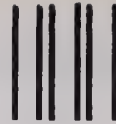
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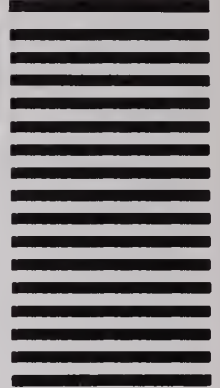
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Carpal Tunnel Syndrome

A Review of 507 Patients

CHRIS P. TOUNTAS, M.D.;* CHARLES J. MACDONALD, M.D.;* JEFFREY D. MEYERHOFF;† and DAVID M. BIHRLE†

A series of 507 patients with 806 hands diagnosed as having carpal tunnel syndrome were reviewed. 34.7% were work related with more males (51.7%) being affected than females. Of those patients evaluated with electromyography, 86.9% were positive for carpal tunnel syndrome. Two hundred sixty-two hands were treated conservatively, and 535 were operated upon. 79% were graded as good results following surgery. Thirty-eight hands were found to have variations of the median nerve.

THOSE PERIPHERAL NERVES of the extremities which predispose themselves to mechanical compression do so by being present in a relatively unyielding anatomic space. Such is the carpal canal and a syndrome of median nerve compression characterized by paresthesiae, numbness, pain and weakness.

The syndrome was recognized over 100 years ago and there were many reports alluding to the probable diagnosis, etiology and treatment.

One of the classic reports about carpal tunnel syndrome appeared in 1966 and was written by Dr. George S. Phalen¹, a past president of the American Society for Surgery of the Hand. This report describes the wrist flexion test which is now commonly known as Phalen's test. He had previously written about median curve compression at the wrist in 1950, 1951, and 1957. MINNESOTA MEDICINE also published a review of 1,215 patients in 1965 by Yamaguchi² of the Mayo Clinic.

The carpal canal is bounded posteriorly, medially and laterally by carpal bones and anteriorly by the transverse carpal ligament. Contained within the canal are the nine extrinsic flexor tendons of the digits, tenosynovium, median nerve and its vascular supply.

In early stages, the paresthesiae and numbness are intermittent. Patients frequently are awakened from sleep with tingling or pain which is relieved by changing positions, shaking the hand or hanging the extremity over the bed. These symptoms may be related to the days use and it is probably edema within the canal that precipitates the discomfort. In many cases, pain is characteristic and radiates proximally whereas



Fig. 1 — Tinel's sign.

conditions producing more proximal nerve compression will cause pain to radiate distally. As the condition progresses, numbness becomes more constant, and complaints of dropping objects and weakness of grip become more pronounced and atrophy develops in the thenar musculature. Carpal tunnel syndrome is often bilateral.

We have undertaken a review of 507 patients from our practice which is almost exclusively devoted to the upper extremity.

Conditions associated with carpal tunnel syndrome included arthritis, diabetes, hypothyroidism, and pregnancy. Some direct causative factors were foreign bodies, fractures of the radius or carpus, ganglia, lipoma of the median nerve and amyloidosis. Eleven (2.2%) of the patients had a family history of carpal tunnel syndrome and 33 (6.5%) of the patients had associated trigger digits either before or subsequent to the diagnosis.

The clinical assessment includes history as to the distribution of the paresthesiae and numbness which classically includes the thumb, middle, ring, and

*Metropolitan Hand Surgery Associates.

†Macalester College, St. Paul

radial one-half of the ring finger. One or all of these digits may be affected. Additional findings include Tinel's sign (Figure 1), Phalen's test (Figure 2), atrophy of the thenar musculature and weakness when testing the abductor pollicis brevis. Tinel's sign is a light tap over the median nerve at the wrist level which is positive when the patient reports paresthesiae radiating distally in the hand and digits. Phalen's test produces the same paresthesiae with prolonged palmar flexion of the wrist which causes the proximal edge of the transverse carpal ligament to add more compression to the median nerve. Additional confirmation can be made with electromyography and nerve conduction velocities.



Fig. 2 — Phalen's test.

Four hundred twenty-nine patients, who were suspected of having carpal tunnel syndrome had 621 hands evaluated with electromyography and nerve conduction studies. Three hundred seventy-three (86.9%) patients had 472 (76.0%) hands positive for carpal tunnel syndrome. The diagnosis was reported as positive when there were prolongations of sensory or motor latencies or evidence of abductor muscle denervation.

The patients seem to fall generally into two groups, those which related their symptoms to work and those which did not. In the former category there were 176 (34.7%) patients and in the latter 331 (65.3%). Posch³ in a report of 1201 cases found 36% to be work related. Of the 176 patients in the work related group 85 (or 48.3%) were females, and 91 (51.7%) were males.

Of our 507 patients (Figure 3), 331 had no established relation of symptoms to work. In this non-work group there were 230 females, (69.5%) and 101 males (30.5%). Comparing the sex distribution of all females in the series with a diagnosis of carpal tunnel syndrome, 27% were work related and 73% were not. Of all the males with a diagnosis of carpal tunnel

syndrome, 47.7% were work related and 52.6% were not work related. This seems to show that there is a male preponderance of carpal tunnel syndrome in the work related group.

Many patients had courses of conservative treatment from their primary care physician which usually included anti-inflammatory drugs, vitamins, diuretics, splinting, analgesics and injections of Cortisone. Of the 806 hands we treated 262 (32.5%) were managed conservatively. 124 of those hands which had conservative treatment ultimately were operated upon and the remaining 138 hands responded favorably to conservative treatment.

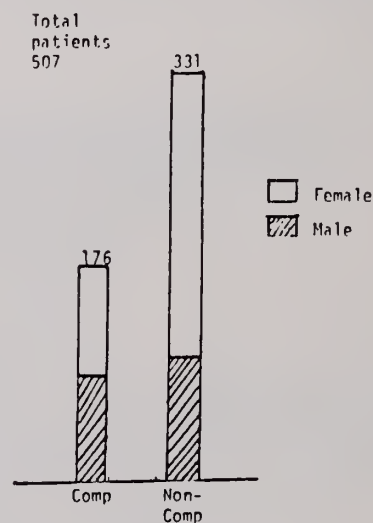


Fig. 3 — Comparison of workers' compensation and non-workers' compensation cases.

Gelberman⁴ found 22% of cases treated with a steroid injection and splinting to respond favorably.

Three hundred eighty-two patients or 535 hands subsequently were operated upon and we graded the results as good, fair or poor (Figure 4). There were 298 (79.0%) placed in the good category when they subjectively reported no night pain, significant increase in sensation, occasional intermittent numbness with overuse and increased strength of the abductor musculature with testing and a loss of preoperative arm pain. 57 (15.1%) patients were graded as fair and there seemed to be residual numbness but improved sensation, occasional night pain, incomplete return of abductor muscle strength and incomplete loss of arm pain.

Twenty-two (5.8%) were felt to be poor results with no improvement or who felt they were worse.

We then compared the postoperative results in the work related and nonwork related groups. We found

Post-operative
Results
382
patients

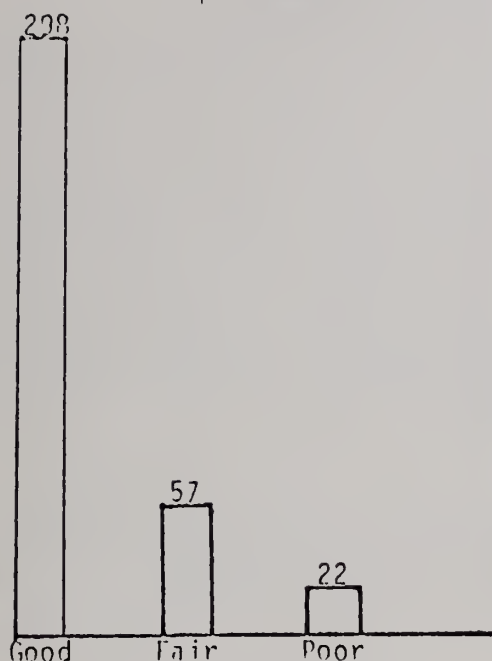


Fig. 4 — Post-operative results.

that in the nonwork related group 221 (85.0%) were good results, versus 77 (65.8%) in the work related group.

Fair results were reported by 30 (11.5%) of the nonwork group and 27 (23.1%) of the work related group.

Of the poor results 9 (3.5%) were in the nonwork related group versus 13 (11.1%) in the work related group.

Surgery was usually carried out under axillary block (30.4%) or intravenous regional anesthesia (41.2%). 6.0% of the cases were done under local anesthesia and 22.5% under general.

Some patients had both hands operated upon at the same time (17.0%). This would depend on surgeon or patient preference.

We have generally avoided doing most carpal tunnel surgery under local anesthesia because we believe that the operative field can be more readily visualized without the presence of the anesthetic fluid. In addition, a tourniquet is used for all cases and its period of tolerance without arm anesthesia is limited. These two factors are of importance if it becomes necessary to perform a tenosynovectomy, neurolysis of the median nerve or exploration of variations within the canal. We found 38 hands with anatomic variations of

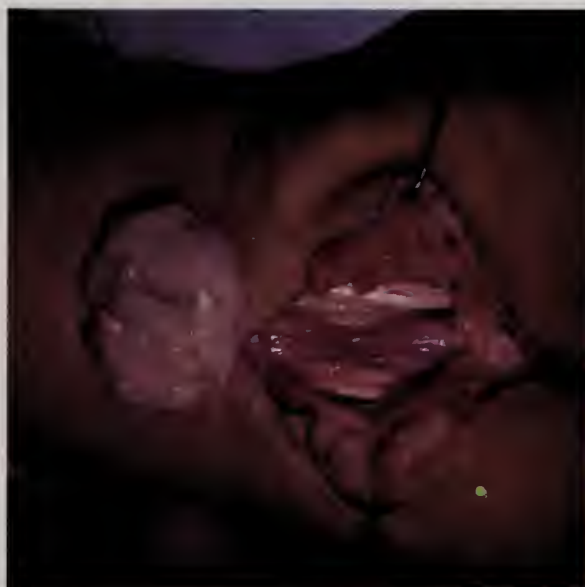


Fig. 5 — Flexor synovectomy severe median nerve compression.

the median nerve within the carpal canal. Lanz⁵ reported a much higher incidence of anomalies in a review of 246 hands in which 29 variations in the course of the median nerve were found.

In our operative series 143 (26.7%) underwent neurolysis, 75 (14.0%) tenosynovectomy (Figure 5) and 7 (1.3%) motor branch releases.

Of the 535 operated hands there were five (.9%) recurrences which were reoperated upon.



Fig. 6 — Median nerve compression.

The findings at surgery usually consisted of a compressed median nerve (Figure 6), occluded median artery, pseudoneuroma of the median nerve proximal to the proximal edge of the transverse carpal ligament and a proliferation of the tenosynovium.

Postoperatively the wrist was immobilized in a plaster splint for 10-14 days and then gradual mobilization and strengthening exercises were begun. Most patients showed sufficient recovery within six to eight weeks to resume most of their former activities. Varying additional periods of time were required for heavy manual users or assembly workers required to do repetitive hand and wrist movements. The mean number of postoperative visits was six.

Summary

Carpal tunnel syndrome is the most common peripheral compression neuropathy. In those patients found to have no work related cause most were fe-

male, whereas males predominated in the work related category.

Conservative treatment is indicated in patients with recent onset, intermittent symptoms and no evidence of atrophy or denervation.

Surgery is an effective treatment with a high percentage of good results in cases which do not respond to conservative management, have thenar atrophy or weakness, denervation, constant numbness and marked prolongations of motor and/or sensory latencies.

The need to perform additional procedures such as neurolysis or tenosynovectomy other than just sectioning of the transverse carpal ligament, in our opinion, requires regional or general anesthesia. An awareness of anatomical variations and their recognition may help to explain some cases of carpal tunnel syndrome.

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Tumors of the Hand

JAMES H. HOUSE, M.D., M.S.* and JOHN STEUBS, M.D.†

TUMORS OF THE HAND present many interesting and varied problems. Fortunately the majority of the lesions encountered are benign and can be appropriately treated with little loss of function. Malignant tumors of the hand rarely occur. Most malignant neoplasms are those originating in the skin and will not be discussed in detail. The squamous cell carcinoma is the most common malignant tumor of the hand and is often associated with chronic radiation occurring in dentists and radiologists. Malignant melanoma also occurs in the hand, often subungual, and may present along the sulcus of the nail where it is often misdiagnosed as a chronic infection.

Soft Tissue Tumors

The most common soft tissue tumor of the hand is the *ganglion* which is not a true neoplasm, but actually a cystic lesion with a stalk that can usually be traced to a joint or tendon sheath. The cyst contains a very viscous gel-like material derived from synovial fluid. The most common dorsal wrist ganglion usually arises from the capsule overlying the scapholunate joint (Figure 1, left wrist). Arthrographic techniques can demonstrate the communication from the wrist joint into the cyst, however, injection of the ganglion will usually not enter the joint because of a one-way valve like mechanism produced by the tortuous stalk of the ganglion where it passes through the wrist joint capsule. Ganglions are also seen along the volar aspect of the wrist, presenting along the superficial branch of the radial artery that penetrates the deep fascia near the volar pole of the scaphoid (Figure 1, right wrist). A firm mass presenting at the proximal crease of the finger is usually a ganglion that arises from the flexor tendon sheath between the first and the second annular pulleys. The so called mucous cyst that presents at the dorsal aspect of the finger, often causing a groove in the finger nail, has also been demonstrated to be a ganglion that originates from the distal interphalangeal joint usually in association with degenerative arthritis and osteophyte formation.

Ganglions may present in multiple sites in the hand and have been implicated as a cause of median nerve compression in the carpal tunnel as well as ulnar nerve compression near the wrist.

Another common benign tumor of the hand is the *giant cell tumor* of the tendon sheath (Figure 2). This is a firm multilobular lesion with an irregular surface, usually seen in the digit, although occasionally it may present in the palm or on the dorsum of the hand. Although it presents as a subcutaneous mass, it usually originates adjacent to synovial tissues of a digital joint or tendon sheath and may be of synovial cell origin. It has often been called a *xanthoma*, because of its brownish yellow appearance or a *benign syn-*



Fig. 1 — The left wrist on this patient has the more common dorsal ganglion whereas her right wrist has a volar ganglion.

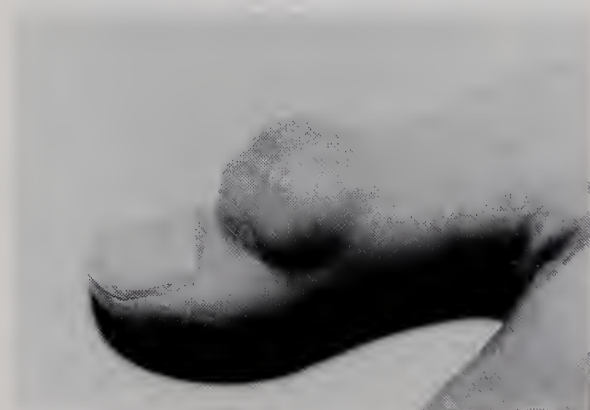


Fig. 2 — A large "giant cell tumor" (benign fibrous histiocytoma) on the dorsum of the thumb.

*Professor, Department of Orthopaedic Surgery, University of Minnesota Hospital, Minneapolis, Minnesota.

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Fig. 3 — A subungual glomus tumor has been excised and placed on the finger nail which must be removed for exposure.



Fig. 4 — This enchondroma of the 5th metacarpal was first noted when minor trauma resulted in an undisplaced pathological fracture.



Fig. 5(A) — This lesion of the proximal phalanx of the ring finger had an appearance suggestive of an enchondroma, however, further evaluation was indicated because of the multilocular appearance.



Fig. 5(B) — There was significant increased activity in the lesion on Tc99 bone scan which would be uncommon for an enchondroma.

ovioma but the term that seems currently in vogue is that of a *benign fibrous histiocytoma*. The tumor may extend beneath the flexor and extensor tendons or create considerable extrinsic pressure on the bone as well as displace the neurovascular bundles. This lesion is usually painless and non-tender and may reach a remarkable size before the patient seeks treatment. Very meticulous surgical excision, carefully tracing the lesion through the various tissue planes to the joint, is essential to minimize the risk of recurrence.

Epidermoid inclusion cysts are relatively common in the hand as a result of penetrating wounds that implant viable epidermal cells beneath the skin where they can grow to reach considerable size and also cause erosion of bone by local pressure. Careful excision of the area of adherence to the skin with the lesion, rather than simply draining it, is necessary for successful removal. A variety of other benign tumors in the hand arise from nerve, fat, and blood vessels.

The *glomus tumor* is an uncommon, but very interesting tumor because of its origin and clinical symptoms (Figure 3). The normal glomus is a peripheral arterial-venous anastomosis that is involved in the regulation of temperature and blood pressure by way of a neuromyo-arterial canal system that connects small arterioles in the digits. The presenting complaint is often that of pain, paroxysmal in character that may be triggered off by exposure of the part to cold. The lesion is very often subungual in location and can be seen as a bluish-red spot through the fingernail. An important clinical finding is exquisite pinpoint tenderness over the tumor which facilitates precise localization. It is often necessary to remove the fingernail to excise the lesion.

Bone Tumors

Tumors arising from the skeleton of the hand are uncommon and are almost always benign. Roentgenogram provide a considerable amount of information about these lesions and greatly aides in their diagnosis. In fact, many of the lesions are detected incidentally on films taken for other purposes.

Enchondromas account for 90% of the tumors arising in the skeleton of the hand with the majority being detected when a pathological fracture occurs. The solitary enchondroma is most commonly found in the proximal phalanx, followed by the middle phalanx and the metacarpal shaft. The defect seen in the phalanx on roentgenogram has an ovoid lytic pattern that resembles a bubble (Figure 4). There is usually a thin margin of sclerotic bone and the central area may be slightly stippled when there are small



Fig. 5(C) — Incisional biopsy was performed through a dorsal tendon splitting approach. Blood filled spaces confirmed the diagnosis of aneurysmal bone cyst. Treatment was curettage and bone graft.

patches of calcification present. When the enchondroma is discovered by a pathological fracture, the digit should be treated in proper functional alignment until the fracture heals, thereby restoring stability to the phalanx. Excision by curettage through a small window and packing with bone chips for the larger lesions will usually result in elimination of the lesion and restoration of good structural integrity to the bone. Fibrous dysplasia and *aneurysmal bone cyst* can present with features similar to that of an enchondroma (Figures 5(A), 5(B), 5(C)).

The *osteochondroma* is the second most common tumor involving the bones of the hand. Roentgenogram demonstrate the common pedunculated projections which begin within the perichondrium at the metaphyseal end of the metacarpals or phalanges (Figure 6). Excision may be indicated because of mechanical impingement with functional motion. Malignant change is rare except in patients with familial multiple osteochondroma. Removal requires resection of the surrounding periosteum and the cartilage cap to minimize the chance of recurrence. Reconstructive surgery with bone grafts may be required

following resection of certain benign lesions.

Malignant tumors of bone are very rare in the hand. The superficial nature of the skeleton usually allows early awareness of the tumor and a limited radical resection will often provide an adequate margin for removal of the tumor with retention of satisfactory hand function. A patient with Ewing's sarcoma is shown in Figure 7. Compare this radiograph with Figure 4 and Figure 5.

Although the majority of the tumors encountered in the hand are benign, it is important to approach all of them in such a way that more radical surgery can be performed if necessary with maximum retention of hand function. Incisions must be carefully planned in case the lesion proves to be malignant so that this biopsy incision can be removed with the lesion without further compromise of function. Adequate anesthesia, a bloodless field employing a tourniquet and the use of magnification, are important techniques which facilitate surgery.

Selected readings on hand surgery on Page 490.



Fig. 7 — This lesion in a 28 year old man was first evaluated after many months of symptoms. It proved to be a Ewing's sarcoma on biopsy. The tumor was resected enbloc, the hand was irradiated and he received chemotherapy but pulmonary metastases became apparent within 6 months and the patient died one year later after developing paraplegia from spinal metastases.



Fig. 6(A) — This large osteochondroma presented as a progressively enlarging palmar and dorsal mass in a 19 year old woman. The radiograph demonstrates widening of the intermetacarpal space and there was concern that this might be a chondrosarcoma because of significant growth after skeletal maturity.



Fig. 6(B) — Enbloc excision and replacement with an iliac bone graft was performed through palmar and dorsal incisions preserving the articular surface and collateral ligaments. Fortunately in spite of recent growth and thick cartilage cap, the lesion was benign.

Colles' Fractures in Young Adults

JEAN EELMA, M.D.* and EDWARD C. McELFRESH, M.D.†

A retrospective study of 56 patients with 58 Colles' fractures in young adults was performed with follow-up examination. Involvement of the radio-ulnar joint and malunion were associated with poor results. Extra-articular fractures did well overall and more complex fractures, worse. Multiple joint involvement did not preclude an acceptable result.

COMPLICATIONS FOLLOWING Colles' fractures are not an uncommon clinical entity. Little has been written which evaluates the problems which occur in the younger adult age group. Younger people, with higher demands on their wrists and frequently high velocity impact injuries, might be expected to do more poorly than an elderly population. Frykman¹ broke down his study group by age. He found an 87% incidence of good and excellent results in those under 45 as compared to a 72% incidence in the 45-85 age group. Large discrepancies in age group sizes prevented him from attaching any statistical significance to this difference. Other authors^{2,3,4} have reported a 24-31% incidence of poor functional results in all age groups. This study is an attempt to determine the incidence of complications in the younger adult age group, the likelihood of obtaining a good result, and to identify any factors which may adversely affect the result.

Materials and Methods

Records from 1976-1979 from Hennepin County Medical Center, the Minneapolis Veterans Administration Medical Center and the private practice of one of the authors, the St. Anthony Orthopaedic Clinic in St. Paul, Minnesota, were reviewed. From these, patients ages 18-45 treated primarily for Colles' fracture were selected. A total of eighty three patients were so identified and fifty-six successfully contacted and examined. Two patients had bilateral injuries, yielding fifty-eight wrists for the study population. The mean patient age was 30.3 years, with a range of 18-43 years and an average follow-up of forty-six and a half months.

Subjective symptoms were recorded as well as the following objective factors: Strength, mobility, neurologic signs, and radiographic changes. Symptoms

included degree of pain, subjective evaluation of weakness, activity limitations, job changes, and need for further surgery. When possible, motion was compared to the opposite wrist and differences recorded. Strength was measured with a Collin's dynamometer and the best of three attempts recorded. Normal strength was considered to be 75% of the dominant side in the case of non-dominant fractures, and equal to the non-dominant side in the case of the dominant-sided fractures. Radiographs were classified according to the method of Frykman (Table 1). Post-immobilization films were measured for degree of dorsal angulation and radial shortening.⁵ Slight deformity was considered to be 0-10 degrees of dorsal angulation and/or 1-3 mm. of radial shortening; moderate deformity was 11-15 degrees of dorsal angulation and/or 4-6 mm. of radial shortening; and severe deformity was greater than 15 degrees of dorsal angulation and/or more than 6 mm. of radial shortening. In evaluating the functional results of treatment, a modification of the Frykman classification was used. An excellent result required no symptoms, less than 15 degrees loss of mobility, in flexion or extension, and no objective weakness. A good result included occasional mild symptoms, no objective weakness, and no motion loss greater than 25 degrees. A fair result included those patients with loss of motion greater than 25 degrees, symptoms sufficient to avoid heavy work and/or loss of strength. Any loss of motion was

TABLE 1
Classification of Colles' Fractures

Fracture	Distal ulnar fracture	
	absent	present
Extra-articular	I	II
Involving radio-carpal joint	III	IV
Involving radio-ulnar joint	V	VI
Involving both radio-ulnar and radio-carpal joint	VII	VIII

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acceptable as long as it did not functionally limit the patient. A poor result was one which resulted in limitations which adversely affected the patient's life-style, regardless of an objective loss of motion.

Results

The distribution of fracture types in the 58 fractures followed is seen in Table 2. This compares well with those patients not contacted. Fifty-five percent had dominant-sided fractures. Five fractures were open, and all of these were treated with irrigation, debridement and cast immobilization. Two went on to have slightly limited motion, but none needed further surgery. Forty-six fractures were treated in a cast, eleven fractures in pins and plaster, and one Class IV injury required open reduction and internal fixation. There was no relation between type of treatment and functional result, nor did more complex fractures require pins and plaster.

Mechanisms of Inquiry

Thirty-five fractures resulted from falling a short distance, eight from falls from a height, ten from motor vehicle accidents, and five from direct blows. Falling from a height resulted in all intra-articular fractures, compared to sixteen of the thirty-five patients who sustained a fall from a short distance. Associated trauma occurred in 31% of cases. Nine patients had one other fracture, six patients had two or more fractures, four patients had abdominal or chest trauma, and two patients had loss of consciousness.

Subjective symptoms of some sort were reported by 82% of the patients. The most common was pain, noted by 75%. Twenty-three patients reported pain with weather change, nineteen with extremes of dorsiflexion (particularly in the young men who wished to resume push-ups), and thirteen with rotatory movements. One patient had severe pain requiring analgesics and a brace. Patients with fractures involving the radio-ulnar joint did not have increased pain with rotatory movements; although they did have more frequent discomfort overall. Thirty-six had sub-

jective complaints of weakness, but this was objectively documented in only five cases. One patient complained of occasional tingling in the hand. Of the twenty one patients who changed jobs, three had done so because of limitations secondary to their fracture. All three had been doing heavy work prior to their injury.

Objective limitation of motion was found in 63% of patients (Table 3). This appeared unrelated to fracture type, except that extra-articular fractures had little limitation of mobility. Reduced mobility was most common in dorsiflexion with fourteen patients showing 10-19 degree lacks, and eleven patients greater than 20 degrees; and in supination, where twelve patients lacked 10-19 degrees and six patients 20 degrees or more.

TABLE 3

	Loss of Motion			30 or above
	None	10-19	20-29	
Volar Flexion	50	5	3	
Dorsiflexion	23	14	11	
Ulnar deviation	47	9	2	
Radial deviation	52	5	1	
Pronation	55	1	2	
Supination	40	12	5	1

Anatomical results compared to fracture type are seen in Table 4. In general, results deteriorated with increasing fracture complexity. There were four cases of non-union of the ulnar styloid noted on radiographs. None were symptomatic.

Functional results were best in the extra-articular fractures (Table 5). The only poor results were noted

TABLE 4

Relationship of Radiographic Results to Fracture Type

Class	No Deformity	Slight	Moderate	Severe
I	8	5	1	
II	5			
III	7	1		
IV	4	1		
V		4	1	
VI	2	1	1	
VII		1	1	
VIII	3	1		2

TABLE 2
Distribution of Fracture Types

Class	Not contacted		Follow-up		Hennepin	St. Anthony	V.A.
	#	%	#	%			
I	7	28	16	28	1	15	
II	5	20	7	12	5	2	
III	6	24	11	19	4	6	1
IV	2	8	6	10	4	2	
V	1	4	6	10	3	3	
VI			4	7	2	2	
VII	2	8	2	4	1	1	
VIII	2	8	6	10	4	1	1

in Class VIII fractures, and overall results in this group were only fair. There were forty-five patients, or 77%, good and excellent results in this series. An inadequate reduction invariably compromised the result, whereas a good reduction did not necessarily give a good result.

TABLE 5
Functional Results

Class	Excellent		Good		Fair		Poor	
	#	%	#	%	#	%	#	%
I	5	50	10	29	1	9		
II	3	30	4	11				
III	1	10	9	26	2	18		
IV	1	10	4	11	1	9		
V			3	9	2	18		
VI			3	9	1	9		
VII			1	3	1	9		
VIII			1	3	3	27	2	100
Total	10		35		11		2	

Within the study group, the more elderly patients had more intra-articular fractures, despite no increased incidence of severe trauma. Overall, they also had less satisfactory results (Fig. 1). Eighty-six percent of the 18-25 age group had good or excellent results as opposed to 62% of the 36-45 age group.

There were complications requiring operative procedures in three cases. Two patients developed symptoms of median nerve entrapment and required release four to six months after fracture. One developed osteomyelitis of the proximal ulna secondary to pin track infection and required curettage and antibiotics. He had loss of reduction and a fair result. There were no cases of shoulder-hand syndrome, and only one documented case of Sudek's atrophy, which resolved with exercise. Finger motion was normal in all cases.

Of the two patients with poor results, one is troubled by persistent pain; the other by significant motion limitations which prevented him from continuing work as a mechanic. The former had severe degenerative change on x-ray with a navicular fracture of the same side; the latter patient's films showed little deformity.

Discussion

Results in this study are comparable to those reported in the literature,^{1,4,6-8} with 77% good or excellent results. There were no patients who had surgery for pain or malalignment, although one patient with a poor result will probably go on to a wrist arthrodesis.

Most patients were satisfied with their result, despite occasional pain. They noted that it took one to two years for maximum motion and strength to return, and that during this time they had learned to modify their activities so that this was not function-

ally limiting. The incidence of subjective symptoms (82%) was considerably higher than that noted in other long-term retrospective studies. Frykman found a 52% incidence of subjective symptoms while Lidstrom noted 45% who complained of pain or weakness. We attribute this higher incidence to the increased demands our population puts on their wrists. No patient felt that symptoms were worsening in the past two years. Compensation claims did not adversely affect recovery time or late results.

Late median nerve compression, present in two cases, resolved with surgery and did not appear to compromise the end result. The absence of shoulder-hand syndrome was also noted by Frykman in his study, and appears related to patient age.

In contrast to previous series, limitation of motion was primarily in dorsiflexion and supination. Overall incidence of motion limitation was also less than previously reported (64% vs. 77%).¹ The cause of this is unknown, but it may be related to the younger population as well as the length of follow-up.

Objectively decreased strength was noted in only 9% of patients, all of whom complained of weakness. Frykman reported a 17% incidence of

RESULTS AS FUNCTION OF PATIENT AGE

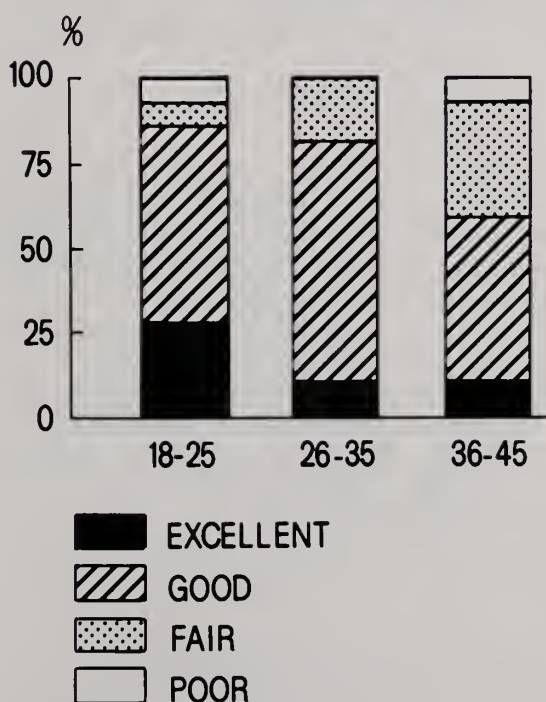


Figure 1 — Results of Colles' fractures given as a function of the patient's age.

weakness in the 18-45 age group, while Lidstrom had a 17.5% incidence overall. All fractures with objective weakness were intra-articular. There was no relationship between disturbances of the radio-ulnar joint and subjective or objective complaints of weakness. These findings are compatible with Frykman's study.

Radiographic findings had a direct bearing on functional results. Fractures of the ulnar styloid, even if nonunited, did not adversely affect functional result. However, involvement of the radio-ulnar joint resulted in only 52% good or excellent results, versus 90% good or excellent results for fractures not involving this joint. As noted by other authors, malunion caused a less than excellent result, although it did not rule out

a good result. In general, functional results deteriorated with increasing joint involvement. An anatomic reduction did not guarantee a good result in any fracture type.

Conclusions

Functional results in this series did not differ significantly from those previously reported with more elderly populations. Results in young people were not as abysmally poor as expected. Several factors, particularly involvement of the radio-ulnar joint and malunion, were associated with poor results. Extra-articular fractures did well overall, and more complex fractures, worse. Multiple joint involvement did not preclude an acceptable result.

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AMA Scientific Reports

Each year the AMA House of Delegates approves numerous scientific reports prepared by the Council on Scientific Affairs. These are concise, highly informative, and oriented to the needs and interests of practitioners. The MMA Interspecialty Council reviews these reports and encourages individual physician members to obtain reports which pertain to their practice.

Reports on the following subjects were accepted at the MMA Interim Meeting in December:

- Pneumococcal, Influenza and Hepatitis-B Vaccine
- Percutaneous Transluminal Angioplasty (PTA)
- Calcium Channel Blocking Agents
- Dietary and Pharmacologic Therapy of the Lipid Risk Factors
- Cochlear Implants
- Addition of Thiamine to Alcoholic Beverages
- In-Utero Fetal Surgery
- Physician Mortality and Suicide
- Automobile-Related Injuries

If you would like a copy of any of these reports, contact Linda Lacker at the MMA Office (2221 University Avenue S.E., Suite 400, Minneapolis, Minnesota 55414, 612/378-1875).

Selected Readings on Hand Surgery — House and Sieubs (Page 486.)

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Bursitis and Tendinitis in the Hand, Wrist, and Elbow

An Approach to Treatment

WILLIAM P. COONEY, III, M.D.*

Inflammation around the tendons and joints that move the hand and wrist is a frequent source of pain and discomfort in the working man and woman. Such problems as triggering of the fingers, catching and snapping at the base of the thumb, carpal tunnel syndrome, and flexor and extensor tenosynovitis are not uncommon problems faced by the practicing physician.

THE MAJORITY of problems of tendinitis or bursitis represent stress overuse. The stress overuse can be occupational related or sports related but the basic underlying pathology is usually the same. Occupational problems are common in assembly line workers, food processors, and office workers (stenographers, typists, etc.). These activities involve repetitive wrist flexion-extension, forearm rotation, or pinch or grasping actions. Recently vibrational instruments such as grinders, sanders, polishers, electric knives or cutters have been recognized as an additional cause of local tendinitis and carpal tunnel syndrome. Fixed holding positions that require continuous wrist flexion or intermittent pinching or grasping can result in local trigger areas or tendinitis. Professionals such as dentists, anesthesiologists, and even hand surgeons are susceptible to stress-related bursitis and tendinitis as depicted by a recent dentist with squeaker's wrist (abductor pollicis longus bursitis). This condition resulted from a combination of holding his dental mirror with his wrist in radial deviation-flexion and from use of a chain saw (vibration) over a long week-end.

Sports-related stress overuse is not too distinct from industrial overuse but is a more commonly recognized condition. In the young athlete, gymnast wrist (dorsal capsule strain or impingement), ganglion cyst (volar or dorsal wrist), and finger or thumb ligament strains are most frequent and can be difficult to diagnose since they can simulate more serious injuries such as scaphoid fractures, joint dislocations, or ligament tears. In the adult, lateral epicondylitis (tennis elbow) is, without question, related to repetitive overuse or improper use of the wrist in striking a ball with a racquet or club. It is now as common in squash, racquetball, and platform tennis as it has been in tennis. Medial epicondylitis (golfer's elbow) and rotator cuff problems (including impinge-

ment syndromes) are also stress overuse conditions related to stick or racquet sports. Other recognized entities include DeQuervain's (APL) tenosynovitis and extensor carpal ulnaris tendinitis at the wrist; pronator syndrome (median nerve symptoms aggravated by pronation) in the forearm, and radial nerve entrapment accompanying lateral epicondylitis at the elbow. The common factor which attends most of these conditions is overuse in the middle-aged athlete who is slightly out of shape and/or fails to properly warm up. That occupation and sports injuries are of similar etiology is pointed out by the recent anesthesiologist who developed squeaker's wrist while overpracticing for a cross-country ski race — his symptoms and signs were not different from the dentist mentioned above.

Diagnostic Factors

History

The key to diagnosis of stress-overuse related hand, wrist and elbow problems is the patient's history. In the young athlete, a change in the training program or a new sport will bring on symptoms of stress overuse. Symptoms of pain *after* competition are more common than those during the activity itself. Many will try to "play through" their discomfort. One recent tennis enthusiast tightly strapped and taped his elbow and extensor origin and then wore a long-sleeve shirt to cover the offending area. Eventually pain at rest required medical treatment. Wrist injuries are particularly difficult to sort out since the patient may not remember an injury. Gymnastic, roller skating, or skateboard activity usually is a strong hint of an hyperextension wrist injury. In the younger patient, this may be a one-event occurrence that fails to improve with time and extended use. The older athlete generally has a history of longer repetitive participation overuse than that of a single event. Repetitive stress, improper warm up and poor body mechanics can generally

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be picked out of the history. Occasionally, there will be a combined history of sports and work overuse that bring on the inciting symptoms. It is important to remember, however, that the wrist, in some patients is like the back in others — a source of pain that has no apparent cause, clear pathology, or need for other than supportive treatment.

Work-related stress overuse is most common at the level of the wrist and elbow and is symptomatic in the worker who is involved in repetitive stress. Repeated wrist flexion extension activity either on the assembly line, in the shop or as a food handler is commonly reported and, like sports stress problems, becomes more symptomatic *after* rather than during work. "First cousin" to each other are carpal tunnel syndrome, flexor tendinitis, and trigger finger symptoms. These may bother the patient at work but more commonly occur at rest or at night. Carpal tunnel symptoms are usually nocturnal, waking the patient and causing them to shake or rub their hands. Others complain of numbness while driving a car or after work while reading a paper or book. More proximal median nerve symptoms can occur with pronator syndrome in which repetitive forearm pronation compresses the median nerve and results in numbness in the hand and pain in the forearm after repetitive use.

Vibrational equipment will also produce hand numbness and tingling as well as tendinitis, and a history of such instrument use should be sought.

Physical Findings

Examinations that reproduce the patient's symptoms help confirm the suspected diagnosis of localized tendinitis, neuritis, or bursitis. Testing muscle function in the hand, wrist or forearm both by active resisted as well as dynamic movements help point out the offending tendon, muscle or bursa. Specific test such as Finkelstein's test (pain in APL-EPB tendons with wrist ulnar deviation and thumb palmar flexion); Lister's test (painful radial neuritis demonstrated by resisted long finger extension); Tinel's sign (paresthesia into fingers with percussion over the median nerve) further help confirm the diagnosis. One must be aware, however, of referred signs which divert the examiner's attention from the problem. This occurs, for example, with trigger finger or thumb (MCP joint level tendon entrapment) in which symptoms are felt at the interphalangeal joints, or APL tenosynovitis or bursitis in which the squeaking or crepitus from the forearm is felt distally at the base of the thumb; or medial or lateral epicondylitis in which muscle pain or tenderness is located distally down the forearm rather than directly over the epicondyles.

Radiographs are also important to rule out underlying fractures, dislocations or avulsion injuries. In the wrist, shoulder, elbow and even finger joint, arthrograms can be helpful to diagnose or dismiss significant joint injuries.

Finally, local xylocaine injections alone or with cortisone are also quite helpful in pin-pointing or excluding specific tendinitis-bursitis areas of inflammation since the painful area should be relieved immediately by the analgesic injection.

Differential diagnoses are important before deciding specific treatment. On the radial side of the hand, one needs to separate thumb CMC arthritis from DeQuervain's tenosynovitis and radial-scapoid impingements. Thumb joint symptoms should be reproduced by the "grind test" since axial rotation with pressure will produce pain with thumb base arthritis and not with the other complaints. Flexor carpi radialis tendinitis on the volar aspect of the wrist should be differentiated from volar ganglion cysts and wrist sprains and from scaphoid tuberosity avulsion fractures by Xrays and resisted wrist flexion testing. Comparison with the normal wrist can be helpful in determining if local weakness or tenderness is present or increased. Trigger fingers and trigger thumbs must be diagnosed as something other than absent or ruptured tendons or fixed joint contractures following joint trauma. Palpation of the contracting tendon and appropriate Xrays are the means to do this.

At the elbow, differentiation between lateral epicondylitis and radial nerve entrapment can be difficult, and, in some patients, the conditions co-exist. In radial nerve entrapment, we usually find: (1) pain on palpation distal to lateral epicondyle; (2) pain increased on resisted supination; (3) pain on resisted finger extension but not wrist extension; (4) tenderness along the line of the radial nerve. Both conditions may have pain over the lateral epicondyle but in "tennis elbow" it is more severe and aggravated by resisted wrist extension.

Medial epicondylitis can be similarly confused with ulnar neuritis or proximal median nerve entrapment. The professional-type athlete (particularly tennis or baseball player) may have both medial epicondylitis and ulnar nerve entrapment as may the food handlers such as ham boners, skimmers or those who repetitively place large stresses on the flexor pronator origin. Local injections or nerve testing may help separate these two conditions.

Treatment

Treatment of bursitis, tendinitis, and nerve related sensitivity syndromes are best considered in relation-

ship to the severity of patient symptoms. For the majority, early diagnosis and prompt treatment of rest, appropriate splinting and the injection of cortisone or use of oral, non-steroidal anti-inflammatory medications will be successful.

Changing occupational demands and sports stress is paramount to improving patient health, and, in this sense, rest is the most important of these treatment modalities. For work-related and sports-related injuries, the employer, industrial nurse, coach or trainer must be made aware of causal relationships between the patient's job or sports effort and his symptoms. The importance of modifying activities to prevent aggravation or re-injury must be pointed out. A written note requesting a rest period, variation on training program or job re-education and training can be most helpful to both patient and employer and increases employer-employee cooperation. Most employers today want to help the employee on the job to decrease workmans' compensation costs and return them to productivity. Therefore, it is helpful for the physician to state the specific job limitations as well as the expected time for recovery. Similarly, with the athlete, especially the high school/college competitive type, modification rather than restriction of training is more acceptable to patient and coach than no training, and an acceptable training program can usually be worked out. Written instructions on the

specifics of re-training help speed recovery and prevent re-injury.

When complete rest of the part is needed, we prefer a supportive plaster or plastic cast. For intermittent rest, orthoplast splints combined with oral non-steroidal anti-inflammatory medications are quite helpful. Restrictions and guidelines on splint use should be provided. For difficult patients or unclear diagnosis, a permanent cast ensures that the patient has rested the part and often demonstrates to others the seriousness of the problem.

A general guide to the treatment of the many inflammatory tendinitis, neuritis and bursitis conditions that can occur, is listed in Table 1.

Once an accurate diagnosis has been made, the cause and treatment outlined, specific use of anti-inflammatory medication can be prescribed. Some of the most common medications that might be used today include those listed in Table 2.

Finally, recurrence of inflammatory conditions is not infrequently seen. Many of these are the result of returning to the same job or sport without altering training programs or job performance. Some recurrences are related to individual body chemistry. That is, some people cannot tolerate certain types of repetitive stress and should not engage in that job or sport. Other factors can be related to the physician treatment of the problem. The following preventives

TABLE 1

<u>Diagnosis</u>	<u>Cause</u>	<u>Treatment</u>
Triggering fingers	Rule out rheumatoid arthritis	1. Local cortisone
	Work friction stress	2. Surgical release (frequent)
DeQuervain's disease (abductor pollicis longus tendinitis)	Repetitive pinch and grasp	1. Local cortisone
	Work stress	2. Radial thumb orthoplast splint
		3. Surgical release (infrequent)
Carpal tunnel syndrome	Idiopathic	1. Local cortisone (20% effective) and orthoplast splint
	Flexor tenosynovitis	2. Surgical release (99 + % effective)
	Colles' fractures	1. Aspiration and local cortisone
Ganglion cyst	Sprain of finger or wrist	2. Surgical excision (frequent and successful)
		1. Oral anti-inflammatory agents
Flexor carpi radialis tendinitis	Occupational stress (assembly line)	2. Cortisone
		3. Local cortisone
Tennis elbow (epicondylitis)	Sports (racquet)	1. Wrist orthoplast cock-up splint, Froimson band, and oral anti-inflammatory agents
	Work stress — repetitive wrist motion	2. Local cortisone and wrist or elbow splint
		3. Surgical release (infrequent)

listed in Table 3 should be considered at times of recurrence or treatment complications.

In conclusion, bursitis and tendinitis are common problems involving the hand, wrist, and elbow. The etiology of these conditions are related to stress overuse and the pathophysiology is similar whether the underlying factors result from work-related or sports-related stress. A correct diagnosis will result from a proper and accurate history and physical examination.

Treatment by avoiding or modifying the causal elements, proper rest, and appropriate use of oral anti-inflammatory medications or local cortisone should result in resolution. Recurrence can be physician-related (wrong diagnosis), patient-related (failure to follow treatment, wear splints or take medication) or employment/sports-related (early return to job or sports activity). All factors must be carefully considered in treating these conditions.

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TABLE 2

Agent		Administration
Aspirin	325 mg	6-8 tablets/day
Ibuprofen (Motrin)	400 mg	3 tablets/day
Indomethacin (Indocin)	25 mg	t.i.d.
Phenylbutazone (Butazolidin)	100 mg	t.i.d. (300-400 mg/day)
Methylprednisolone (Medrol) (oral)	10-20 mg	q.i.d. (Medrol dose pack)
Methylprednisolone (Depo-Medrol) (20 mg/ml)	5-80 mg	Intramuscular
Triamcinolone (40 mg/ml)	10-40 mg	Intramuscular or intra-articular
Betamethasone (Celestone) (6 mg/ml)		
Intra-articular	Hand	1-4 mg (approx. ½ ml)
	Wrist	4-12 mg (approx. 1-2 ml)
	Elbow	6-18 mg (1-3 ml)
		3-6 mg (½-1 ml)
Tendon or bursa	Hand	6-12 mg (1-2 ml)
	Wrist	12-18 mg (2-3 ml)
	Elbow	

TABLE 3

Pitfalls and Complications	Prevention
Recurrence	Correct diagnosis
Persistent pain	Improper injection or splinting re-evaluation
Infection	Betadine scrub prep (10 min)
Allergy	Check history
Intravenous injection	Contact skin test
Skin atrophy	Aspiration first
Postinjection flare (crystalline synovitis)	Avoid tracking with intradermal injection
	Spontaneously subsides (ice, analgesics)

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Replantation

ALLEN L. VAN BEEK, M.D., F.A.C.S.;*† KEVIN STRATHY, M.D.;† MICHAEL FASCHING, M.D.†
and J. BART MULDOWNY, M.D.*†

Replantation of an amputated part has greatly augmented the reconstruction of devastating hand injuries. Initial assessment of the amputation victim, followed by evaluation of the amputation stump and amputated part, are essential primary physician roles. A guide for selection of patients for replantation and part care is discussed as well as surgical principles, post-operative care, and documented results.

THE ADVENT OF REPLANTATION surgery was initiated when Malt first reported a successful upper arm replant. However, successful digital replantation awaited the design and commercial production of small needles and sutures. Following this technologic advance, a new aspect of vascular surgery developed — the reliable repair of small blood vessels using the operating microscope. Using this surgical innovation, microscopic repair of blood vessels as small as 0.5 mm allows attachment of even small portions of tissues in infants.

Initially digital replantation surgery was felt to be a fad, even an effort in futility. Presently replantation is accepted as an essential reconstructive method used to salvage devastating injuries of the hand.

This section will summarize information about the selection of patients for replantation, care of the amputation victim, care of the amputated part, transportation, operative management, post-operative care, rehabilitation, and assessment of functional results following replantation.

Classification of Amputation Injuries

The term “replantation” must be reserved for completely amputated parts. Unless a part is totally amputated, the term “revascularization” is utilized. Digital replantation and limb replantation are different entities. One classification for digital amputation is shown in Figure 1. It almost correlates with the zones of tendon injuries, but the zones are based on the difficulty of replantation, expected functional results, and uniqueness of the anatomy in the area. A Zone I amputation is expected to have a good result. Even if the profundus tendon repair is adherent, compensation by the PIP and MP joints will assure good

range of motion. Because neural regeneration only has a short distance to go, it will be quite good. Zone II and III injuries are more difficult. The amputation has occurred in “no man’s land” and gliding of the tendons will be impaired. Therefore, the functional result will be compromised and a significant loss of active motion expected. It is almost certain that Zone II and III amputations will require a subsequent tenolysis. In Zone IV injuries, functional results can be expected to be quite good. Some gliding of the tendons will be expected, and the relatively short distance for neural regeneration to extend will assure protective sensibility. In Zone IV and V, movement is from extrinsic tendon function; however, intrinsic function will be poor and therefore fine dextrous utilization of the hand is limited. Following a peripheral

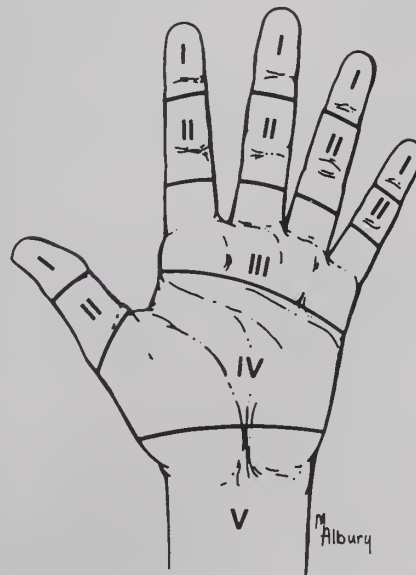


Fig. 1 — Amputation can be classified into zones based on anatomy and structure size.

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nerve injury, neural regeneration is never perfect, but protective sensibility can be expected and even two point discrimination can return in some patients with digital replantation.

Amputations above the level of the wrist are called limb amputations and are also divided into zones (Figure 2.) Amputations above this level are referred to as major amputations using this system. The larger volume of tissue and skeletal muscle in the amputated part increases the potential for complication in major extremity amputations. This is an important consideration when planning a replantation at this level. Following major limb replantation, myoglobinuria, hyperpyrexia, hyper-kalemia, and acidosis can develop producing a replantation toxemia. Arterial repair with delayed venous repair prevents high initial concentrations of toxic products from being released into the circulation, but results in substantial blood loss (Figure 3.)

Patient Selection

Three categories of patients can be identified when considering management of amputation injuries. They are the very young, the old, and those between. One hesitates to assign chronological age to these groups because the physiology, activity and desires of patients or families are different. Certainly the young child is a more favorable candidate for replantation than the elderly individual with compromised health. Younger victims have enhanced healing, regeneration and recuperation abilities — they are the best candidates for replantation. In older individuals, some of these qualities are lost, making them less ideal candidates for replantation. We have successfully replanted amputated digits in children as young as 15 months of age and in senior citizens as old as 72 years of age.

Patient selection for replantation is also determined by the tissue that is amputated. In the upper extremity, the thumb, hand, and forearm are crucial to function and would be considered essential to replant if feasible. Feasibility is determined by the patient's overall health history, occupation and desires. If multiple digits are amputated, replantation will be attempted when feasible. In young children or other special circumstances, even single digits will be replanted. Candidates for single digit replantation must be selected carefully to avoid further impairment of hand function. Certainly a child sustaining a single digit amputation is an excellent candidate for replantation. However, the same amputation in a middle-age electrician usually would not be replanted.

Another important factor in patient selection is re-

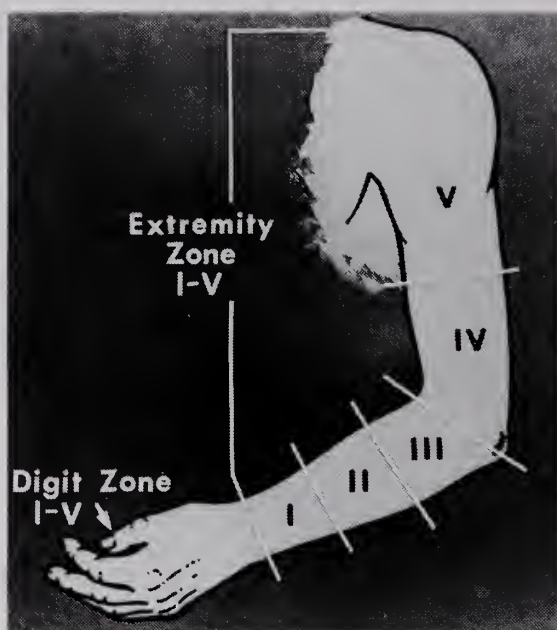


Fig. 2 — Limb amputation zones.

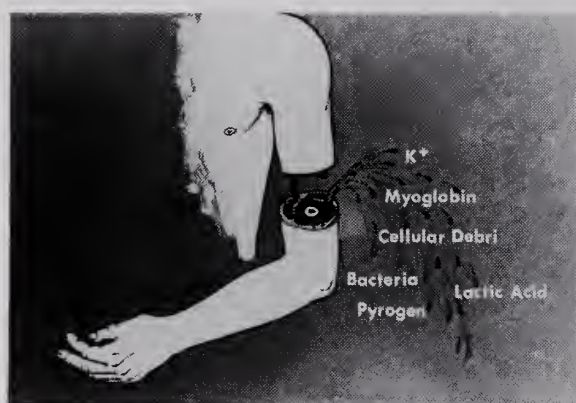


Fig. 3 — In limb replantation, venous repairs are done after arterial repairs. This prevents the initial high concentrations of toxic materials from being circulated systemically. Blood transfusions are usually required in limb replantation in Zone II or higher.

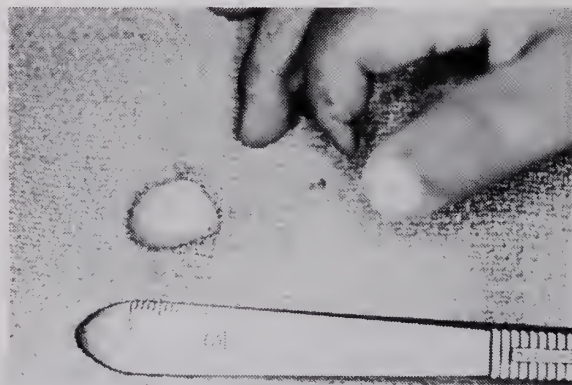


Fig. 4 — A Zone I digit amputation in 18 month child. Replantation successful.

lated to the mechanism of the injury. Sharp, guillotine type amputations are easier to successfully replant and have a more favorable function outcome than amputations involving severe avulsions with myotendinous separation, stretched nerves, and ribboned blood vessels.

Often a dilemma may arise based on the desires of the patient or his family. While it may seem logical to the physician that a finger should not be replanted, the victim or family frequently have different feelings about the amputation, and a careful discussion with the victim or family is essential. If a patient refuses to undergo amputation and insists upon replantation, despite the hand surgeons advice to the contrary, the finger may be replanted. The ability of the hand to work and provide dexterous skills is an important one, and for many of our patients, the appearance of the hand is an equally important function.

The most distal level at which microvascular replantation can be reliably performed is shown in Figure 4. Beyond this level, venous repair is a difficult problem and compromises reliable replantation.

Initial Care of the Amputation Victim

It is extremely important that the primary care hospital examine the patient thoroughly to rule out occult injuries. The amputation victim always has priority over the amputated part. When an amputation has occurred, it must be assured that other occult injuries or physiological disorders are not associated with the accident.

Bleeding from the amputation stump can usually be controlled by a snug pressure bandage and elevation. Clamps or ligatures are seldom necessary and frequently create additional damage. It is not necessary to identify structures with ligatures or clips. If bleeding cannot be controlled by snug dressings or direct pressure, vessels must be controlled by direct methods or a tourniquet applied.

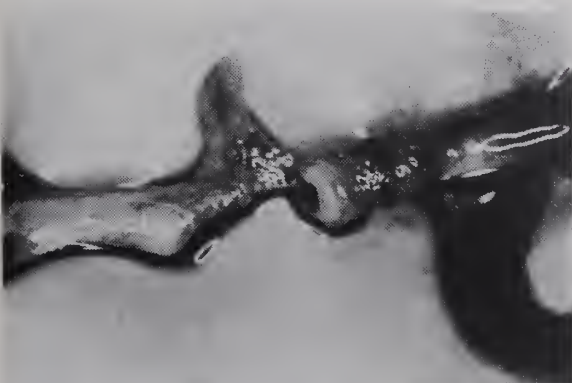


Fig. 5 — An incompletely divided ulnar artery. This situation will frequently cause major hemorrhage.

The incompletely amputated part that has an incompletely transected artery can bleed massively and is usually difficult to control. (Figure 5) This rare situation can produce hypovolemic shock, and in this situation direct or tourniquet control of the vessel is essential.

Care of the Amputated Part

Following amputation of a part, rapid cooling of the part is important. After receiving the amputated part, it should be evaluated for skeletal and soft tissue injuries. Xrays of the part are very important. The general status of tendons, skin, bone and neurovascular bundles should be known before making a decision regarding replantation.

Following assessment, the part should be gently rinsed to remove loose gross dirt. The part is then wrapped in a moist towel. The moist towel is placed in a plastic bag, and the bag sealed. The plastic bag containing the part is placed on ice for cooling (Figure 6).

Operative Management

While a thorough review of operative management is not appropriate, several principles have changed with the development of replantation surgery. Presently one avoids excessive skeletal shortening and makes up deficits in vascular conduit with vein grafts.

CARING FOR AMPUTATED TISSUE

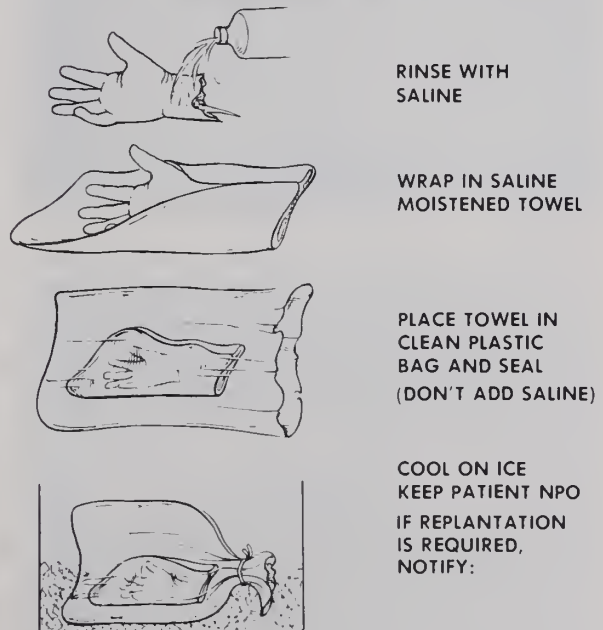


Fig. 6 — A copy of this figure posted in the emergency room may help patient care.

Skin tension must be avoided, and the liberal use of skin grafts is essential if excessive tissue swelling or traumatic loss of skin is present. In severe extremity injuries with soft tissue and skeletal disruptions, we use external fixation rather than internal fixation. Whenever possible, all structures are repaired primarily including arteries, veins, nerves, bones and tendons. If required, immediate skin coverage can be accomplished by combining replantation with microvascular free flap transfers. Though seldom required, this modality can prevent vascular graft disruption and failure when full thickness flap cover is essential. All vessel and nerve repairs are done with microscopic enhancement using 10 and 11-0 nylon. Cultures and sensitivities of the initial wounds are obtained to guide antibiotic therapy if infection should ensue and also are a useful guide for prophylactic antibiotic therapy.

Post-Operative Management

In major limb replants, surgical re-exploration of the replanted part within the first 48 hours post-operatively is performed to assure that non-viable tissue is not present. The retention of non-viable tissue after this period of time presents a major threat of infection, particularly clostridial gas gangrene. Also if there is inadequate cutaneous cover for crucial structures, flap coverage can be accomplished at this second look procedure using microvascular free flap transfers. Along with the usual clinical parameters, post-operative monitoring is enhanced using temperature, Doppler, or photoplethysmography monitoring of the replanted part. The post-operative care of these patients is crucial and is provided by nurses specifically trained to monitor this special group of patients. Post-operative care also consists of strict elevation of the amputated part and prophylactic antibiotics.

Heparin, Dextran and aspirin are seldom used. However, if intraoperative or post-operative care becomes complicated by thrombosis of blood vessels, continuous intravenous Heparinization is utilized. Intra-arterial Reserpine or calcium blocking agents are occasionally used to alleviate vascular spasm.

Transportation

After stabilizing the victim and assessing the part, transportation to a facility with microsurgical capabilities is required. Extensive amputation injuries may require 12 to 24 hours operative time, and advance notice is useful. A telephone call and discussion with the microsurgeon *will help to prevent needless referral* in cases deemed poor candidates for replantation

and speed care for those requiring it.

In digital amputations, transportation time of four to six hours is acceptable. In arm replantations, transportation time of two or three hours is acceptable. If ground transportation time will exceed these limits, air transportation is advisable. An air ambulance can be dispatched from Minneapolis in 30 to 60 minutes from the time of notification on a 24 hour basis, weather permitting.

Assesment of Functional Results

From December, 1980 to December, 1982, the authors have had 42 patients referred requiring microvascular repairs of the upper extremity. Twenty-two patients had complete amputations and 20 had devascularizations. The results presented are based on complete amputations only. The 22 patients with complete amputations had parts replanted. Only 5 patients had sharp amputations. Seven victims had crush injuries, and the remaining 10 had severe avulsion injuries. The primary mechanisms of injury were industrial, press injury, power saw, or farm related accidents. Three amputations were single digit injuries with an age of less than 20, and the remainder were multiple digit injuries and amputations. Six replanted parts infarcted for a survival rate of 82%.

Digit replantation can be expected to achieve 48% of normal active motion. Fifty six percent of patients having replantation will require a subsequent surgical procedure. One-third of patients with digit replantation obtain some two point discrimination (S-3+ Highest Scale), one-third have protective sensation, and one-third do not have protective sensation. Ten percent of patients changed occupations.

Case Reports

An 8-year-old sustained amputation of thumb and index com-

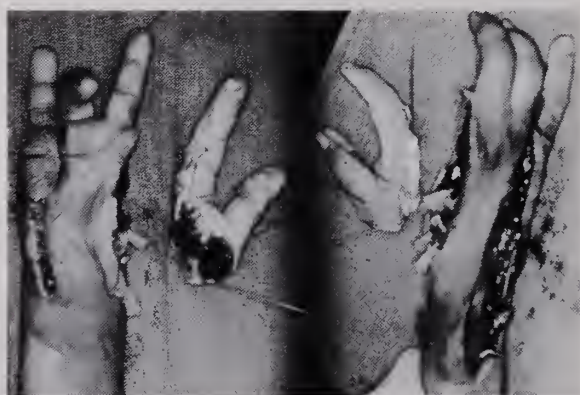


Fig. 7 (A) — An 8 year old with digit amputations and devascularization small finger.

bined with devascularization of the small finger (Figure 7(A)). Multiple arteries, nerves and veins were repaired. Five months post-op, all fractures are healed. Active joint motion is shown, and a tenolysis is planned later (Figure 7(B)).



Fig. 7 (B) — Result. (See Figure 7 (A)).

A 42-year old woman amputated her thumb. (Figure 8(A)). Replantation was performed. She was hospitalized for 5 days. Seven months post-replantation, she has 15 pounds key pinch, 40° active range of motion, MP joint motion, but no IP joint motion. She has improving sensation (S-3). No further surgery is planned (Figure 8(B)).

A 20 year old male sustained bilateral severe avulsion amputations at work (Figure 9(A)). Two replanted digits survived on each hand. Tendons were reimplanted in the muscle bellies. He was hospitalized for 23 days. He will require tenolysis and nerve



Fig. 8 (A) — 42 year old with thumb amputation.



Fig. 8 (B) — Result.

grafts in the future. Four months after amputation, the right hand has good pinch and grasp function because of normal MP joint function. The left hand has good pinch function but poor grasping function because of limited MP joint and IP joint motion (Figure 9(B)).

A two year old child sustained an amputation of his arm from a bear bite (Figure 10(A)). His post-operative course was complicated by cutaneous necrosis and partial digital necrosis. He has had a free flap transfer, nerve graft and tendon grafts performed since replantation. One year post injury, he has some wrist motion, no digital motion, and returning sensation. He uses the hand to hook, hold, and perform other assistive functions. His elbow function is good (Figure 10(B)).



Fig. 9 (A) — 20-year-old with bilateral amputations.



Fig. 9 (B) — Result.

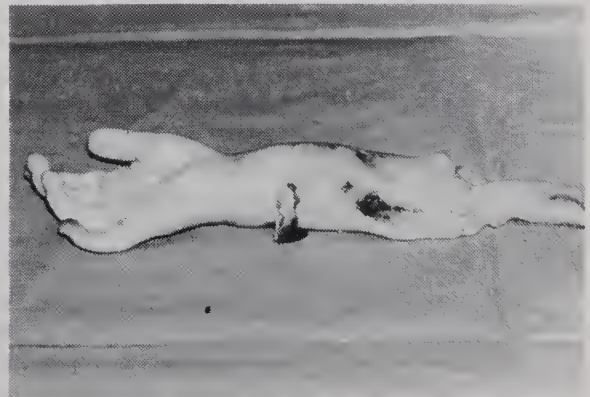


Fig. 10 (A) — 2-year-old with arm amputation.

Summary

Following an amputation, assure that victim doesn't have occult injuries. Proper care of the amputated part involves cooling but not freezing the part. The most important parts of the upper extremity to replant are the distal forearm, hand, or multiple digits. Selected single digit amputations may be replanted.



Fig. 10 (B) — Result. (See Figure 10 (A)).

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Minnesota Chapter of American College of Surgeons

Annual Meeting: The Minnesota Chapter of the American College of Surgeons will convene for its Annual Meeting in Minneapolis, MN, on Friday, September 9, 1983, at 6 p.m. at the Minneapolis Club. The Honorable William Frenzel, U.S. Representative from the Third Congressional District, is the featured speaker who will speak about medical/political issues. For more information, write to H. Bryan Neel III, M.D., Secretary-Treasurer, 200 First St. S.W., Rochester, MN 55905 or phone (507) 284-4065.

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Upper Extremity Reconstruction by Free Tissue Transfer

MICHAEL B. WOOD, M.D.,* WILLIAM P. COONEY, III, M.D.* and GEORGE B. IRONS, JR., M.D.*

Free tissue transfer procedures have expanded the scope of reconstructive options for the upper extremity. We report on our experience with free skin flap, vascularized bone, composite digit and functioning muscle transfer. The indications regarding the selection of these techniques as well as expected results with representative case report examples are reviewed. We believe these procedures represent a valuable technique in the salvage and reconstruction of certain upper extremity problems.

IN THE LAST TWO decades microsurgery has become a relatively commonplace technique in most major hospitals with an expanding spectrum of clinical applications. Public familiarity with the term has become so great that "Microsurgeon"[†] now occupies a position with "Pac Man" and others on the list of commercially-available video games! Although limb or digit replantation is undoubtedly the most sensationalized application of microvascular surgery, the clinical value of this technique for elective limb reconstruction by free tissue transfer is becoming increasingly recognized.¹⁻³

The term "free tissue transfer" implies the isolation of an autogenous tissue structure on its nutrient vascular pedicle, transection of the pedicle and then transfer to a distant site with immediate revascularization by anastomosis of the nutrient vessels at the recipient site. The structure may be a skin, omentum or muscle flap for soft tissue coverage, a bone segment with vascularity, a toe for thumb or finger replacement, or a functioning muscle. Other applications of less certain clinical value include vascularized joint transfers, nerve segments, periosteal flaps and finger transfers in special circumstances.

In the last three years the authors have carried out approximately 150 free tissue transfer procedures, 38 of which have involved the upper extremity as the recipient site. We have been particularly impressed by the value of this approach for difficult limb reconstructive problems. It is the purpose of this report to present our experience in terms of indications and results with free tissue transfer techniques in the upper extremity.

Methods

All cases of free tissue transfer utilized for upper extremity reconstruction over the preceding three years were reviewed and analyzed. All procedures were carried out and subsequently followed by the authors. Details regarding the type of transfer, goals of treatment, choice of donor tissue, indications, results and complications were evaluated.

Results

There were four type of free tissue transfer procedures carried out in this series — skin or muscle flap for soft tissue coverage, toe-to-hand transfer for digital reconstruction, innervated muscle transfer when tendon transfer technique was not available, and bone segment (fibula) transfer for acute and chronic large bony defects of the upper limb.

Skin or Muscle Flap Transfer (Figures 1(A)-1(C))

There were 13 cases in this group. In all the basic intended goal was soft tissue coverage otherwise requiring a distant pedicle flap. The donor tissue site included tensor fascia lata myocutaneous flap (five), latissimus dorsi myocutaneous flap (three), foot first webspace flap (three), dorsalis pedis flap (one), and groin flap (one).

The indications which directed us to choose a free skin flap procedure over a conventional distant pedicle flap is this group varied. In four instances a requirement for sensibility in the flap led us to utilize a free flap with a predictable sensory nerve (foot first webspace or dorsalis pedis flap) which was coapted at the recipient site. In five cases the upper extremity defect was judged too massive to permit the use of a conventional distant pedicle flap without extreme donor site disfigurement. In most of these cases the

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complexity of exoskeletal hardware further complicated or prohibited ideal positioning of the limb for a more conventional procedure. In two additional patients the extremes of age (three years and 71 years) encouraged the use of free tissue transfer where minimal immobilization of the limb became a priority consideration. Finally, in two cases where a skin flap was required for primary coverage following release of an elbow flexion contracture, a free transfer was chosen to permit early elbow range of motion.

There were complications in three instances. In one (groin flap) a venous thrombosis and in another (tensor fascia lata) an arterial thrombosis, both on the night of surgery, necessitated re-exploration and revision of the anastomoses. Both were salvaged with complete flap survival. The third complication was a transient femoral neuropathy associated with a tensor fascia lata donor site.

There were no flap failures in this group. In all the goal of stable, supple soft tissue coverage was achieved. In the four cases where a neurotized flap was utilized two point discrimination at 5 mm resulted in one, and protective tactile sensibility without two point discrimination resulted in two additional cases. One case was lost to follow-up after three months and, therefore, could not adequately be evaluated in this regard. In the two cases of the extremes of age and in the five cases of massive defect the procedure was most gratifying. In both of the cases utilized in conjunction with elbow capsulotomy a flap complication precluded early elbow range of motion and, therefore, did not prove advantageous over a conventional distant pedicle flap.

Toe-to-Hand Transfer (Figures 2(A)-2(D))

There were 13 cases with 15 toe transfers in this group. In all the basic goal was thumb or digit reconstruction with restoration of sensibility, tendon and joint function, growth potential and acceptable aesthetic appearance. Isolated second toe was utilized in nine cases, isolated great toe in one, combined second and third toes in one, combined great toe and second toe in one, and isolated fifth toe in one. The latter two cases were children with congenital hand and foot deformities. In both instances amputation of the toes for lower extremity function purposes was recommended and hence, this dictated the choice of donor toes.

In general, the indication for toe transfer is the requirement for thumb or digit reconstruction where simpler, alternative methods are not acceptable. Specifically, one of the main indications in our series was for thumb reconstruction in the child where con-

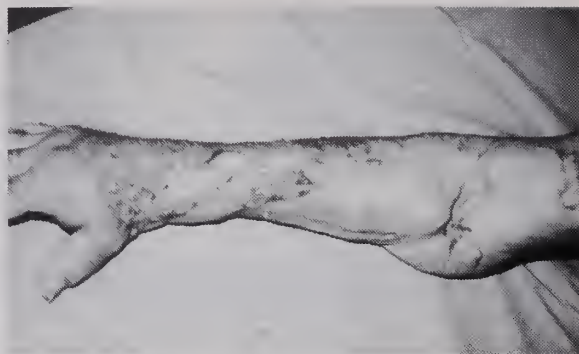


Figure 1(A)



Figure 1(B)

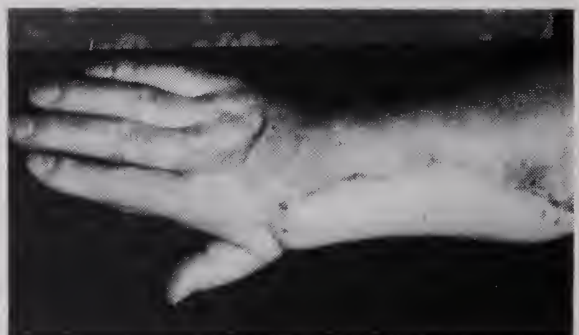


Figure 1(C)

tinued growth would occur and where there was no expendable digit in the hand for pollicization (five cases). When a digit can be sacrificed (one of four normal fingers or a damaged finger in the presence of two or more normal fingers) we recommend pollicization in preference to toe-to-hand transfer. In four of our cases, however, pollicization under these circumstances was refused and, thus, toe transfer was elected as the second most reasonable alternative. Three additional cases were adults but with only one or no remaining digits in the hand and loss of thumb length proximal to the metacarpophalangeal joint. The indication for the last case (second and third

combined toe transfer) was for finger reconstruction in a patient with amputation of all digits but the thumb.

Complications in this group of patients have been relatively frequent. These have included arterial thrombosis in one case, a mild tourniquet com-

partment syndrome of the donor lower extremity in one, a superficial wound dehiscence of the donor site in three, partial necrosis of one of the adjacent skin flaps accompanying the toe in two, and a stress fracture of the second metatarsal in one case of isolated



Figure 2(A)



Figure 2(C)

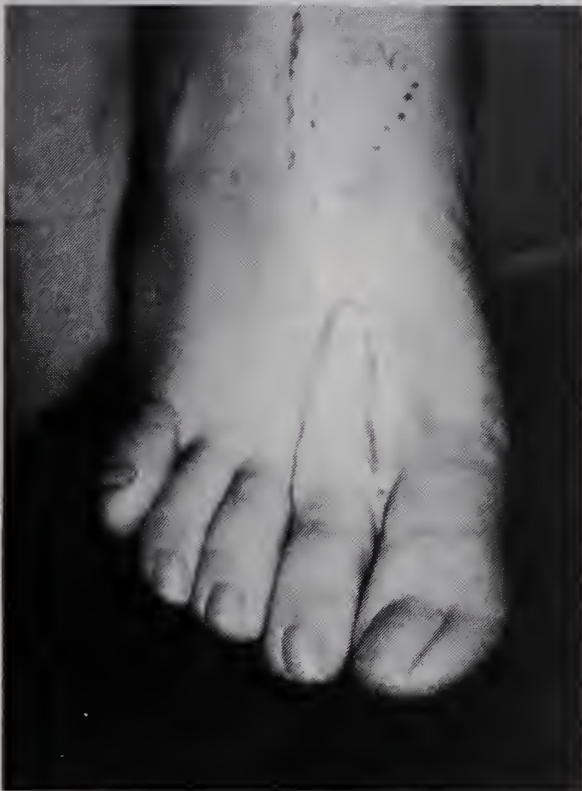


Figure 2(B)



Figure 2(D)

great toe transfer. With the exception of one case none of these complications appear to have compromised the ultimate end result with regard to donor or recipient site.

There was one failure in this group as a result of arterial thrombosis despite operative re-exploration and revision. In the remaining 12 cases and 14 toes there was complete survival of the part. Two cases are too early postoperatively (under six months) to evaluate the result. Of the remaining ten patients, satisfactory function in terms of mobility, sensibility, and appearance has been realized. Seven of these ten cases, however, required secondary operative procedures including tenolysis, osteotomy, interphalangeal joint arthrodesis and opponensplasty to achieve this satisfactory functional state.

Functioning Muscle Transfer

There were six cases in this group. In all the goal has been to achieve a single but strong active motor function usually for thumb and/or finger flexion. In each case we have utilized the latissimus dorsi muscle with neurotomy to the thoracodorsal nerve.

The indication in five of the cases has been a Volkmann's type ischemic necrosis of the forearm flexor musculature. In all there has been sufficient extensor compartment involvement to preclude the use of tendon transfer techniques for reconstruction. In one case the indication has been for elbow flexion in an old C5-7 brachial plexopathy without available elbow flexor-plasty alternatives. In this case motor innervation of the muscle transfer was achieved by cross-chest neurotization.

There has been one complication in this group involving a postoperative arterial thrombosis in the flap which eventually went on to be a functional failure. A revision of the arterial anastomosis was carried out on the first postoperative night with subsequent complete survival of the overlying cutaneous portion of the flap. However, the muscle went on to marked atrophy and fibrosis, presumably on the basis of the transient postoperative ischemic episode.

All of the tissue flaps in this group have survived from the vascular standpoint. The results at this stage postoperatively are less well-defined. Two of the six cases are less than six months postoperative but one has early evidence of weak motor function. Of the remaining four, one is clearly a failure in terms of motor function and three are exhibiting varying degrees of function which is continuing to improve to the present time.

Vascularized Bone Segment Transfer (Figures 3(A)-3(B))

There were six cases in this group. In most of these the goal was to achieve stable bony union across a lengthy forearm skeletal defect. In all instances in this group the fibula, based on the peroneal artery and venae comitantes was utilized. One of the cases which included the proximal physis was additionally based on the lateral genicular artery and venae comitantes.



Figure 3(A)

In five of the six cases the indication was a long-bone defect of the forearm in excess of 10 centimeters. In four of these the radius was involved — two as a result of wide resection of a low-grade malignant primary bone tumor and two as a result of posttraumatic osteomyelitis resection. The remaining forearm case involved a massive defect of the ulna consequent to neurofibromatosis with congenital pseudoarthrosis. The final case in this group involved the clavicle with a relatively short defect measuring six centimeters but with failure of multiple prior attempts to obtain union by conventional means.

There were complications in two of the fibular transfers. In one a postoperative peroneal palsy of the donor leg occurred. This resolved spontaneously but required the use of a drop-foot orthosis for six months. The second complication was that of osteomyelitis developing about a fixation screw. In this



Figure 3(B)

case viability of the fibular segment was not jeopardized and bony union occurred without difficulty. However, hardware removal with debridement and saucerization of the infected area was necessary.

One fibula transfer was a failure. This was the case used for ulna reconstruction with congenital pseudoarthrosis. The fibula graft developed a persistent proximal nonunion despite hardware revision, further conventional bone grafting and electrical stimulation. Eventually the fibular segment developed a tapered, atrophic appearance similar to the original ulna. One additional case in this group has not clearly radiographically united at one end. This is the case involving the clavicle. However, in spite of the lack of definite radiographic evidence of a union, the patient is asymptomatic and the hardware at the involved end is showing no suggestion of loosening. We, therefore, feel that bony union is probable. The remaining four cases of fibular transfer, all for radius reconstruction, have gone on to firm union and hypertrophy. In three of these bony healing was confirmed by two months and in one by four months postoperative.

Discussion

Overall in this series of 38 cases restricted to the upper extremity, 36 (95%) were successful in terms of tissue viability. This compares with a success rate of 85% in our series of over 100 free skin flap transfers mainly to the lower extremity. In terms of clinical

success, however, the value of free tissue transfer in the upper extremity must be weighted against the expectations of more conventional treatment methods.

In the group of free skin or muscle flap transfers the desired goal was achieved in all but intervening complications occurred in three of 13 (23%). When compared to alternative treatment options,⁴ when available, of a distant pedicle flap, these results are probably equivocal. We, therefore, believe that when a distant pedicle flap will suffice for reconstruction, a free tissue transfer has no added advantage. There are, of course cases, as in this series, where the presence of exoskeletal hardware, the massive size of some defects, the requirement for neurotized skin coverage and perhaps the extremes of age make a conventional approach unavailable or undesirable.⁵⁻⁷

In the group of toe transfer patients, for the most part, alternative reconstructive methods were lacking. With this in mind the value of this procedure is clear with survival in 12 of 13 cases and satisfactory function in all ten cases with adequate follow-up. However, in contrast to some of the isolated case reports in the literature⁸⁻¹¹ and the sensationalized results of the public media, we have not found this procedure to be a straightforward, one-stage reconstruction. Seven of our ten cases with adequate follow-up have required secondary surgical procedures to achieve satisfactory function.

There have been relatively few series of free functioning muscle transfers reported to date. Some very impressive results have been published which testify to the value of this technique in the absence of available tendon transfer methods.¹²⁻¹³ Our series does not contribute any useful information in terms of long-term function because of our relatively short follow-up period to date. We do report, however, that muscle function is possible in cases neurotized by a reconstructed motor nerve which suggests an appreciable degree of potential versatility of this procedure may exist.

Finally, the value of vascularized bone segment transfers in the upper extremity¹⁴⁻¹⁶ is supported by our series. In five of the six cases an extensive bony defect existed where conventional bone grafting would be prone to stress fracture and require extensive immobilization for complete incorporation. The final case which involved a lesser defect had already proved its refractory character to conventional methods prior to considering a vascularized bone transfer. Apparent success in five of six cases (83%) with radiographic bone union and hypertrophy in as short as two months in some compares favorably with

the expectations of conventional bone grafting techniques with such cases.

We conclude, on the basis of this series, that free tissue transfer techniques have a definite role in the therapeutic armamentarium for reconstruction of the upper limb. A high degree of success can be achieved even in those cases which have failed or can be expected to fail with conventional modalities. In addition, these techniques may offer an array of recon-

structive options and goals not available by conventional procedures. However, complications are not infrequent, secondary procedures may be required, and long-term data regarding functional value is still sparse. We, therefore, feel in the more straightforward and usual reconstructive problem, free tissue transfers are not a substitute for the sound application of established principles and procedures.

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Common Running Injuries of the Leg and Foot

by Rob Johnson, M.D.

The author and the editors did not include the references for the Table published in the article by Dr. Johnson, July issue of *Minnesota Medicine*, page 443.

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Dupuytren's Contracture

LOWELL H. KLEVEN, M.D.*

This article is an update on current concepts of Dupuytren's Disease as it pertains to the diagnosis, pathogenesis, and treatment. It is based on a review of the literature and the author's clinical experience.

THE CONDITION KNOWN as Dupuytren's Contraction is a common entity most frequently manifested clinically by a subcutaneous nodule(s) in the palm and a flexion contracture(s) involving a finger(s), particularly on the ulnar side of the hand. Involvement in the hand is not limited to the palmar fascia but may involve the fibrous retinacular and paratenon tissues dorsally as well. The name Baron Guillaume Dupuytren is associated with this condition due to his extensive disertation on the subject in a lecture in Paris in 1833, which was published the following year in *Lancet*. He described the condition which he felt was induced by stressful use (in a wine merchant and a coachman) and its treatment (open fasciotomy). His dissection of a cadaver hand involved with the condition verified it was due to shortening of the palmar fascia. There are earlier references in the literature describing this entity and its treatment.¹

Early involvement with Dupuytren's disease may be evident as an increased coarseness or tightness of the palmar tissue in contrast to the usual suppleness to palpation. Subsequently, a palpable nodule(s) involving the palmar fascia develops, usually in the region of the distal palmar crease, most commonly at the base of the ring finger. Over a varying period of time (on the average three to four years) a significant loss of finger extension at the metacarpal phalangeal (and or) proximal interphalangeal joint may develop along with limitation of lateral mobility of the finger at the metacarpal phalangeal joint. The tight pretendinous fibers of the palmar fascia become prominent and bowstringing due to shortening. Overlapping (dimpling) of the skin often occurs due to attachment of the fascia to the skin in the region of the distal palmar crease. Frequently the distal interphalangeal joint of the finger develops an extension contracture due to tension on the oblique retinacular ligament. Knuckle pads arising from the paratenon over the

dorsum of the proximal interphalangeal joint often occur but do not limit function. (Figure 1). The small finger ray is nearly as often affected as the ring finger ray, otherwise, frequency of involvement diminishes as one proceeds radially across the hand. Involvement of the thumb and first web space, though less common, presents a challenging problem.

The condition affects both hands in the majority of patients. Incidence in the dominant hand is slightly more common than in the nondominant hand in cases of unilateral involvement in most series. The ratio of male involvement to female involvement is usually about four to one. The mean age when the condition becomes clinically apparent is approximately 50 years in the male and 60 years in the female.² Hueston noted plantar fascial involvement in 20 percent of his cases, however, no patients developed toe contractures. He also reported an incidence of 2.7 percent of male involvement with Peyronie's disease.³ Skoog reported an incidence of knuckle pads in 11 percent of his 50 patients.²

Association with other medical conditions, namely ethanolism, epilepsy and diabetes mellitus is not unusual. Skoog noted an incidence of Dupuytren's con-

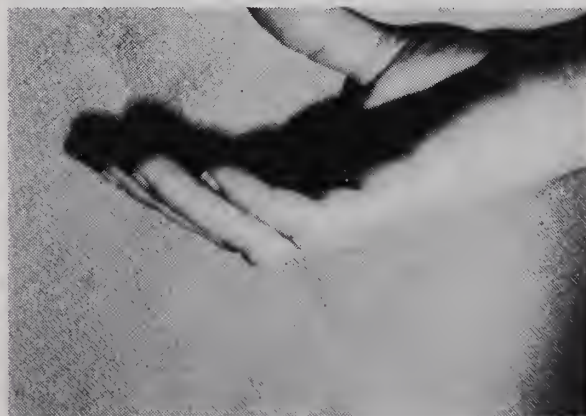


Fig. 1 — Knuckle pads over the dorsum of the proximal interphalangeal joints of a 33-year-old female who has been treated for many years with anti-seizure medication.

*Clinical Associate Professor, University of Minnesota, Minneapolis.

tracture in 42 percent of patients with epilepsy.²

There appears to be a hereditary factor in most cases of Dupuytren's contracture. A casual family history may be positive in only 20 percent of patients, however, an investigative family search done by Ling on the families of 50 patients with Dupuytren's contracture revealed a 68 percent familial incidence.⁴ Pedigrees worked out by him suggested that Dupuytren's disease genetically involved a single Mendelian dominant gene. The expression of the gene as a clinical condition was nearly complete in males over 75 years of age but less complete in females at that age.

The role of trauma as an etiologic factor is controversial. In most cases it is not felt to be a significant cause, however, some investigators feel that possibly certain types of occupational or recreational activities may place repetitive stress to the palmar fascia and, thereby, induce or aggravate the condition in a person predisposed to the disease. These investigators base their reasoning on the finding of a blood pigment histologically in the involved palmar fascia which they attribute to microhemorrhage secondary to trauma. The fact of the matter, however, is that the condition is no more common in an individual involved in heavy labor than those in sedentary occupations. The fact that the nondominant hand is nearly as frequently involved as the dominant would tend to rule against the significance of trauma. The occurrence of the condition is extremely rare in Blacks and Orientals and this, too, mitigates against the traumatic etiology. To the contrary, however, it is not unusual to see the condition appear to worsen in association with immobilization of a patient as in chronic invalidism or of an individual's upper extremity necessitated by injury.

Recent biochemical and electron microscopic findings have given rise to controversial theories as to the pathogenesis of Dupuytren's disease. Gabbiani and Majno observed the presence of myofibroblasts in the nodules of patients with Dupuytren's disease on electron microscopy.⁵ These cells have microfilaments (tubules) resembling the myofilaments and smooth muscle cells and are believed to have active contractile properties. The presence of these cells have been confirmed by others, however, they have not been observed in all cases examined. Some investigators theorize this cell plays a major role in producing the contracture. Gelberman et al. found an association between the presence of this cell in the nodule in patients with a tendency toward clinical recurrence of a contracture.⁶

Brickley-Parson et al. on the other hand, em-

phasized the major biochemical changes in the affected palmar fascia.⁷ They noted that Type III collagen was abundant in patients with Dupuytren's disease rather than Type I collagen which is present in normal palmar fascia. Post translational modifications included a very elevated hydroxylysine content, an increase in the total number of reducible cross-links, and the appearance of hydroxylysinohydroxynorleucine as the major reducible cross-link. These biochemical changes are similar to those which occur during the active stage of connective tissue wound repair in normal individuals. These changes were present both in the clinically uninvolved as well as the clinically involved connective tissues of patients with Dupuytren's contracture. They noted that myofibroblasts were sporadically present in the nodules of clinically involved tissue but not in the uninvolved fibrous tissue. They proposed that these modifications of collagen in Dupuytren's disease are not the underlying basis for fibrous tissue shortening but that they rather represent the usual changes that occur when new collagen is being rapidly formed during the active stages of repair and healing of connective tissues. They believe the contraction results due to shortening of the "tissue fabric" as the new collagen is replacing the original tissue. The resultant shorter piece of "tissue fabric" contains collagen molecules, fibrils, and fibers of normal length and organization, but with pretranslational and post-translational modifications similar to those in collagens during the active stage of connective-tissue repair in general.

In most cases of Dupuytren's contracture the condition does not progress to the point where surgery becomes necessary. Radical excision of the palmar fascia in early cases of Dupuytren's contracture as recommended in the past to prevent progression should not be done. No successful nonsurgical treatment of Dupuytren's contracture has been found despite the numerous modalities tried. Each patient must be evaluated individually as to whether or not surgery is indicated. There is no general rule as to when treatment should be undertaken, however, surgery is not advisable unless there is at least a 30 degree contracture with significant functional limitation or symptoms. Excision of the nodules, which may be somewhat painful early in the course of the condition, is contraindicated as it may speed the progression of the condition. Percutaneous palmar fasciotomy frequently done in the past is rarely indicated except, perhaps, as a preliminary to more extensive surgery because of the high incidence of recurrence.

Limited open fasciotomy through a transverse inci-

sion followed by an elliptical free full-thickness skin graft as described by Gonzalez is a simple reliable procedure which can be done under local anesthesia with very little risk of complication.⁸ This disrupts the deforming fascial band and interposes uninvolved tissue. It is especially useful in the elderly or poor risk patient, (Figure 2).



Fig 2 — Pre (top) and post-operative (bottom) photos of a 59-year-old male diabetic with a history of multiple myocardial infarcts treated with bilateral open fasciotomy and skin grafts under axillary block anesthesia.

Radical palmar fasciectomy is usually contraindicated because of the high morbidity. This procedure is frequently complicated by skin necrosis, subcutaneous hematoma and a painful dystrophic stiff hand.

Most commonly fasciectomy of only the involved fascia is indicated (selective or limited fasciectomy). This can be done through various skin incisions. McIndoe recommended a transverse incision in the distal palm and a Z-plasty incision in the finger.⁹ Hueston recommends that the incision be made longitudinally over the course of the contracted band and then later converted to a single or multiple Z-plasty prior to closure.³ McCash recommends exposure of the involved palmar fascia through transverse incisions in the distal palm crease and in finger flexion

creases.¹⁰ Following the excision of the involved fascia, the transverse incision in the distal palmar crease is left open to heal by secondary intent thereby avoiding complications such as hematoma formation. The technique of exposure for limited palmar fasciectomy which the writer has found to give excellent exposure and not be associated with frequent complication involves a curving longitudinal incision over the involved fascia from the base of the palm in the thenar crease out onto the finger to beyond the contracted joint(s). This incision should approach the flexion creases at an angle as described by Hamlin,¹¹ then curve in an opposite direction toward the next flexion crease obliquely across the finger to the opposite side where it again curves if more distal exposure is necessary. The apices of the incision at the creases may be modified from a "Y" to a "V" to give greater exposure and allow skin shifting at closure. The skin flaps are then carefully raised preserving the subcutaneous tissue, where present, to maintain circulation. In areas where the fascia is immediately under the skin, care is taken to avoid button holing. Skin circulation may be compromised in these areas; however, the skin will usually remain viable and take as a free graft. Fasciectomy of the involved fascia is done beginning proximally in the palm releasing it from the adjacent palmar aponeurosis and attachments to the transverse carpal ligament. The involved pretendinous band is raised and the septa extending between the lumbricals and neurovascular bundles is released. The paratenon of the flexor tendon sheath must be preserved. The involved fascia can be readily dissected from this as it is not invasive. The natatory ligament expansions are removed in the web area. The pretendinous bands often bifurcate just proximal to the metacarpal phalangeal joint giving off a fascial band designated as the spiral cord which is situated dorsal to the neurovascular bundle making the nerve susceptible to injury as it lies immediately subcutaneous to the spiral cord.¹² The neurovascular bundles must be followed very closely as they are often surrounded by involved tissues or displaced from their ordinary bed. Resection of the involved tissues is carried out to beyond the contracted joint. If one begins proximal and proceeds distally with the dissection the neurovascular bundle can be more clearly followed, and as the fascia is freed up from its attachments proximally, further passive extension of the finger is possible allowing better exposure. If fasciectomy is adequate rarely is capsulotomy of the PIP joint necessary and usually gentle manipulation will further extend the joint. If, however, there is shortening of the joint capsule and volar plate due to a

longstanding flexion contracture, there is often associated articular cartilage loss which would preclude good joint mobility post-operatively. Prior to closure the tourniquet (which is used in all cases) is released and hemostasis obtained. Loose approximation of skin flaps is then accomplished with nonabsorbable suture over a drain to which suction may or may not be applied. A well padded splinted coaptation dressing is applied maintaining the hand in functional position. This splinted bandage is removed five to seven days post-operatively at which time a lighter compression bandage is applied which will allow active motion. Dressings and sutures can usually be removed approximately two weeks post-operatively.



Fig. 3 — Pre (Top) and post-operative (Bottom) photos of the right hand of a 59-year-old male who underwent limited palmar fasciectomy.

Active exercises are encouraged. If satisfactory progress is not made in the early post-operative period, then formal physical therapy and/or dynamic splinting is instigated. (Figure 3 illustrates a case managed in such a manner.)

Complications of the type of treatment outlined above are usually of a minor nature when compared to those associated with the more radical type of fasciectomy done in the past. Small areas of skin necrosis will be allowed to epithelialize whereas larger areas, though rarely encountered, may require delayed skin grafting. Digital nerve damage should be recognized at the time of surgery and dealt with appropriately. Subcutaneous hematoma formation requires early recognition and drainage. Wound infection, fortunately rare, is of course also a possibility. The complication of a painful dystrophic hand is very difficult to deal with and a subject matter not to be covered at this time.

In the series described by Hueston, secondary surgery was required in 49 of the 202 patients which underwent a total of 264 primary palmar fasciectomy.³ 11 of these procedures were done for *extension* of the involvement to another area of the hand. 38 of these procedures were done for *recurrence* of the involvement in the same digit, most frequently the small finger. There is a higher incidence of recurrence in patients who show other stigmata of Dupuytren's diaphysis (such as knuckle pads) in addition to the contracture.

In Summary, Dupuytren's contracture is a frequently occurring condition in which there is often a predisposing hereditary factor involved, however, there are often other significant medical associations such as ethanolism and epilepsy. The progression of the condition, as far as extent of involvement and rate of progression, varies a great deal. Surgery is often not indicated. Excision of the involved fascia is indicated if a significant symptomatic contracture is developing. More radical fasciectomy is contraindicated as it does not successfully ablate the condition and is associated with more complications.

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Book Reports

PRINCIPLES OF AMBULATORY MEDICINE, edited by L. Randol Barker, M.D.; John R. Burton, M.D., and Philip D. Zieve, M.D., Williams & Wilkins, Baltimore, 1982, 1127 pp. Cost \$72.

I awaited this new textbook with considerable enthusiasm. There were several reasons for my excitement. First, I had trained with the editors and was especially impressed with the style of practice and teaching inculcated at The Baltimore City Hospitals and at The Johns Hopkins Medical School. Also, I was familiar with Harvey's **PRINCIPLES OF INTERNAL MEDICINE** which, as a descendant, so to speak, of Sir William Osler's original textbook, had already set a high standard for its practicality and straightforward style. Its popularity has been confirmed by many subsequent editions. I soon discovered that this textbook is very much as great a contribution to the general medical literature. I already find it a useful reference manual for my everyday practice.

Principles contains 99 chapters, in which 64 contributors have participated. The three main editors and contributors, with some few exceptions, attend at The Baltimore City Hospitals and at The Johns Hopkins Medical School.

The first-class text is designed for general and family practitioners and internists, who, according to Dr. Barker, saw 35% and 12%, respectively, of the 556 million office visits to U.S. physicians in 1979. The National Ambulatory Medicare Care Survey of Visits to General and Family Practitioners (NAMCS) has defined ambulatory care as, "health services rendered to individuals under their own cognizance any time when they are not in a hospital or other health institution."

It was as my chief resident that Dr. "Randy" Barker so vividly taught me and other residents at The "BCH" that a patient's status before and after his hospital stay was very important. Indeed, this was to remind us that there was more to our patient's life or death than the acute intervention which occupied our long days and nights. *Principles* is about such non-hospital medical problems.

This voluminous text is meticulously edited: the chapters have been shaped by the contributors and the editors for the needs of the ambulatory care physician. There are excellent diagrams and tables. There are adequate bibliographies of both a general and specific nature after each chapter.

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(Book Review Continued)

rehabilitation, compliance, adolescent and geriatric issues, occupational and environmental disease, and the general physician's role in cancer.

Section Two succinctly covers psychiatric and behavior problems, including substance abuse.

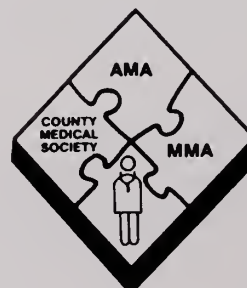
Chapters Three through Thirteen cover allergy, infectious disease, gastrointestinal diseases, nephrology and urology, hematology, pulmonary, cardiology, musculoskeletal, metabolic and endocrinology, neurology, surgery, gynecology, ophthalmology, otolaryngology, and podiatry.

I found the chapters on the principles of ambulatory medicine, on hypertension, on genitourinary, and metabolic diseases most helpful for some recent reference problems. This text is an excellent resource for any general physician's practice — one might use it as a preliminary board review, or as an update, and to appreciate another region's approach to outpatient medicine. I think it may be a more practical reference than Cecil's or Harrison's textbooks of medicine, and certainly it is a complement to them, as well as to any training program or review and update of internal medicine.

Peter J. Dorsen, M.D.
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MINNESOTA MEDICINE

Echoes from Our Past

Osler's Baby on the Tracks

JACK D. KEY, M.A., M.S.*

In the January 1888 number of the *Canadian Medical and Surgical Journal* Dr. William Osler narrated an interesting experience he had in the Northwest in 1886. The facts of the incident, as being accurate, now seem fairly well established but at the time appeared so incredible that Osler was accused of trying to pull off one of his famous Egerton Y. Davis medical pranks.¹⁻⁹ Apparently in 1886 William Osler accompanied his brother Edmund, who was a director of the Canadian Pacific Railway, on a vacation and inspection tour of the railroad to the Canadian west. While enroute Osler heard that a passenger had delivered herself of a baby under unusual circumstances. He terminated his journey to check out the story and later wrote the following:

Mr. Fred Brydges had kindly met our party at the Portage to take us over the Manitoba and North Western Road, and he mentioned that two days before, a woman, while in the water-closet on the train, had given birth to a child, which had dropped to the track and had been found alive some time after. I was so incredulous that he ordered the conductor to stop the train at the station to which the woman had been taken that I might see her and corroborate the story. I found mother and child in the care of the stationmaster's wife, and obtained the following history: She was aged about 28, well developed, of medium size, and had had two previous labors which were not difficult. She had expected her confinement in a week or ten days, and had got on the train to go to see her husband who was working "down the track." Having a slight diarrhoea, she went to the water-closet, and while on the seat labor-pains came on and the child dropped from her. Hearing a noise and groaning, the conductor forced open the door and found the woman on the floor in an exhausted condition, with just strength enough to tell him that the baby was somewhere on the track, and to ask him to stop the train, which was running at the rate of about 20 miles an hour. The baby was found alive on the side of the track a mile or more away, and with the mother was left at the station where I saw her. She lost a good deal of blood, and the placenta was not delivered for some hours. I saw no reason to doubt the truthfulness of the woman's story, and the baby presented its own evidences in the form of a large bruise on the side of the head, another on the shoulder, and a third on the right knee. It had probably fallen between the ties on the sand, and clear of the rail, which I found, on examination of the position of the hole in the closet, was quite possible.

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9. Rehfeldt FC: Tribute to Egerton Y. Davis, or: Long live the baby on the track. *Texas Med* 70:83, March, 1974.

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Minnesota Medical Association

CME in Minnesota

Provided through the Medical Education Subcommittee on CME Resources

For assistance with scheduling meetings, please contact the MMA office (address and phone given below) for information on future medical meetings and CME courses at the state and national level.

Information for each entry is arranged as follows: Date: Name of program; Primary sponsor; Location; Contact person.

August, 1983

16 The Menopause — Risks and Benefits of Estrogen Progestron Therapy; Central Mesabi Medical Center; Central Mesabi Medical Center; CONTACT: Ben P. Owens, Mesaba Clinic, Hibbing, MN 55746; 218/262-3441.

18-20 Leadbetter Symposium — Urolithiasis; U of M; Willey Hall; CONTACT: CME, U of M Box 293 Mayo Memorial Building, 420 Delaware Street S.E., Minneapolis, MN 55455, 612/373-8012.

22-24 Advanced Cardiac Life Support Course; North Memorial Medical Center; NMMC; CONTACT: William Nelson, 3300 Oakdale North, Robbinsdale, MN 55422; 612/520-5200.

25-26 Nursing Home Medical Directors Meeting; U of M; Mayo Memorial Auditorium; CONTACT: CME U of M, Box 293 Mayo Memorial Bldg., 420 Delaware St., S.E., Minneapolis, MN 55455; 612/373/8012.

29-30 Basic Life Support Course; Methodist Hospital; Methodist Hospital; CONTACT: Janell Haugen, Methodist Hospital, 6500 Excelsior Boulevard, P.O. Box 650, Minneapolis, MN 55440; 612/932-5189.

September, 1983

9-10 Foot & Ankle Care of the Adult Patient; Mayo Clinic; Rochester; CONTACT: Postgraduate Courses, Mayo Clinic, 200 1st St. S.W., Rochester, MN 55905; 507/284-2085.

12-16 Radiology/83 Special Imaging; U of M; West Bank Auditorium, Willey Hall; CONTACT CME U of M, Box 293, Mayo Memorial Bldg., 420 Delaware Street S.E., Minneapolis, MN 55455; 612/373-8012.

12-23 First Annual Graduate Occupational Health and Safety Institute; U of M Medical School & Midwest Center for Occupational Health and Safety; Earle Brown Center, U of M; CONTACT: Ruth McIntyre, St. Paul-Ramsey Medical Center, 640 Jackson Street, St. Paul, MN 55101; 612/221-3992.

16-17 Orthopedic Nursing in the 80's; Metropolitan Medical Center and Hennepin County Medical Center; Pillsbury Auditorium Hennepin County Medical Center; CONTACT: Rose Jagodzinski, 701 Park Ave. S., Orthopedic Office 813, Minneapolis, MN 55415; 612/347-2812.

16-17 Annual Meeting, Minnesota Orthopedic Society; Minneapolis; CONTACT: Jack M. Bert, M.D., 307 Gallery Medical Bldg., 17 W. Exchange St., St. Paul, MN 55102.

16-17 Pediatric Update for Primary Care Physicians; St. Paul-Ramsey Medical Center and U of M Medical School; The Saint Paul Hotel; CONTACT: Ruth McIntyre, 640 Jackson Street, St. Paul, MN 55101; 612/221-3992.

19-21 Pulmonary Disease — 1983; Mayo Clinic; Rochester; CONTACT: Postgraduate Courses, Mayo Clinic, 200 1st St. S.W., Rochester, MN 55905; 507/284-2085.

20 Annual Meeting, MN Psychiatric Society; Edgewood Restaurant, Cannon Falls; CONTACT: Donald J. Erickson, M.D. Emeritus, Mayo Clinic, Rochester, MN 55901.

21 Medical Chest; Central Mesabi Medical Center; Central Mesabi Medical Center; CONTACT: Ben P. Owens, Mesaba Clinic, Hibbing, MN 55746; 218/262-3441.

22-24 6th Annual Trauma and Critical Care Seminar; U of M; Hennepin County Medical Center; CONTACT: Donald M. Jacobs, HCMC, 701 S. Park, Minneapolis, MN 55415; 612/347-2810.

23-24 Advanced Trauma Life Support Course; American College of Surgeons State Committee on Trauma, UMD, and St. Luke's Hospital, Duluth, MN; CONTACT: Charles L. Barbee, M.D. ATLS Physician Course Director, 1000 First St., Duluth, MN 55805; 218/727-7259.

26-28 Clinical Microbiology Reviews; Mayo Clinic, Rochester; CONTACT: Postgraduate Courses, Mayo Clinic, 200 1st Street S.W., Rochester, MN 55905; 507/284-2085.

28-30 Obstetrics & Gynecology; U of M; Holiday Inn, Nicollet Mall, Minneapolis; CONTACT: CME, U of M Box 293 Mayo Memorial Bldg., 420 Delaware Street S.E., Mpls. MN 55455; 612/373-8012.

30 Northwestern Pediatric Society Annual Meeting; Chanhassen; CONTACT: Frederic Kleinberg, M.D., Mayo Clinic Rochester, MN 55905; 507/284-2922

September 30-October 1 Vascular Disease; Methodist Hospital and St. Louis Park Medical Center Research Foundation; Radisson South; CONTACT: Elaine Anderson, Assistant Director of Medical Education, 5000 W. 39th Street, Minneapolis, MN 55416; 612/927-3703.

October, 1983

5-7 Internal Medicine Review (10th Annual Course); U of M, Mayo Memorial Auditorium CONTACT: CME, U of M, Box 293 Mayo Memorial Building, 420 Delaware Street, S.E., Minneapolis, MN 55455; 612/373-8012

5, 11, 12 Basic Life Support Instructor Program; Methodist Hospital; Methodist Hospital; CONTACT: Mary Ann Kempcke, Methodist Hospital, 6500 Excelsior Blvd., P.O. Box 650, Minneapolis, MN 55440; 612/932-5167.

8 Current Trend in Ophthalmology — 7th Annual; Mount Sinai Hospital, Minneapolis; CONTACT: Evelyn Peterson, Medical Staff Office, Mount Sinai Hospital, 2215 Park Avenue, Minneapolis, MN 55404; 612/871-3700 ext. 1117.

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DATES: Saturday, September 10, 1983 (Hematology - Urine Cultures -
How to Process Specimens for the Minnesota Department of Health)
Saturday, October 22, 1983 (Microbiology - Urinalysis)

LOCATION: University of Minnesota, Minneapolis

FOR FURTHER INFORMATION: Pat Solberg, Workshop Coordinator
Laboratory Proficiency Workshops
Minnesota Academy of Family Physicians
Suite 426, 2221 University Avenue SE
Minneapolis, Minnesota 55414
612/623-9559

(October continued)

12-15 Principles of Colon & Rectal Surgery; U of M; Mayo Memorial Auditorium, U of M; Mayo Memorial Auditorium, U of M; CONTACT: CME, U of M, Box 293 Mayo Memorial Building, 420 Delaware Street, SE, Minneapolis, MN 55455; 612/373-8012.

13-22 Advanced Cardiac Life Support Course; Methodist Hospital; Methodist Hospital; CONTACT: Joan Peterson, M.D. Methodist Hospital, 6500 Excelsior Blvd., P.O. Box 650, Minneapolis, MN 55440; 612/932-5419.

14 Annual John R. Sebold Memorial Symposium — Arthritis of the Upper Extremity; Bethesda Lutheran Medical Center & Metropolitan Hand Surgery Asso. P.A.; College of St. Thomas, O'Shaughnessy Education Center; CONTACT: Rose Baumann, Metropolitan Hand Surgery Asso. P.A., 280 North Smith Avenue, Room 840, St. Paul, MN 55102; 612/291-8773.

14 Cardiovascular Disease; U of M; CONTACT: CME, U of M, Box 293 Mayo Memorial Building, 420 Delaware St., S.E., Minneapolis, MN 55455; 612/373-8012.

14-15 5th Adolescent Medicine & Health Conference; U of M; Earle Brown Center, U of M; CONTACT: CME, U of M, Box 293 Mayo Memorial Building, 420 Delaware Street, S.E., Minneapolis, MN 55455; 612/373-8012.

14-16 Midwest Allergy Forum; Minnesota Allergy Society, Hyatt Regency, Minneapolis; CONTACT: Dr. Paul Steinberg, 5000 W. 39th Street, Minneapolis, MN 55416; 612/297-3091.

15 Annual Meeting of MN Chapter of American College of Physicians; Hyatt Regency, Minneapolis; CONTACT: Tom G. Bergstrom, M.D., 750 South Broadway, Cokato, MN 55321.

17-19 Recent Advances in Cardiac Catheterization; Mayo Clinic; Rochester; CONTACT: Postgraduate Courses, Mayo Clinic, 200 1st St. S.W., Rochester, MN 55905, 507/284-2085.

18 Antibiotic Update; Central Mesabi Medical Center; Central Mesabi Medical Center; CONTACT: Ben P. Owens, M.D., Mesaba Clinic, Hibbing, MN 55746; 218/262-3441.

19-21 Second Annual Course; Emergency Medicine for Primary Care Physicians; St. Paul-Ramsey Medical Center; St. Paul Hotel; CONTACT: Ruth McIntyre, St. Paul-Ramsey Medical Center, 650 Jackson Street, St. Paul, MN 55101; 612/221-3992.

20-22 17th Annual Orthopedic and Trauma Seminar; Hennepin County Medical Center; Hennepin County Medical Center — Pillsbury Auditorium; CONTACT: Ramon B. Gustilo, M.D., 701 Park Avenue South, HCMC Orthopedic Office 813, Minneapolis, MN 55415; 612/347-2812.

21-22 Annual Meeting of MN Society of Neuro Sciences; Minneapolis; CONTACT: Lawrence Schut, M.D., 4225 Golden Valley Road, Minneapolis, MN 55422; 612/588-0661.

23 Update in Cardiology; Mayo Clinic; Rochester; CONTACT: Postgraduate Courses, Mayo Clinic, 200 1st Street S.W., Rochester, MN 55905; 507/284-2085.

24-26 Clinical Reviews; Mayo Clinic; Rochester; CONTACT: Postgraduate Courses, Mayo Clinic, 200 1st Street, S.W., Rochester, MN 55905; 507/284-2085.

27-28 Medical Management of Disability Claims; U of M; Radisson South, Bloomington; CONTACT: CME, U of M, Box 293, Mayo Memorial Building, 420 Delaware Street, S.E., Minneapolis, MN 55455; 612/373-8012.

November, 1983

3 John I. Coe Symposium — Computers in Anatomic Pathology and Newer Immunodiagnostic Techniques; U of M; Hennepin County Medical Center; CONTACT: John T. Crosson, M.D., 701 Park Avenue, Minneapolis, MN 55447; 612/347/3010

3-4 Society of Shoulder & Elbow Surgeons; Mayo Clinic, Rochester; Postgraduate Courses, Mayo Clinic, 200 1st Street S.W., Rochester, MN 55905; 507/284-2085.

4 Head & Neck Pathology — E. T. Bell Annual Pathology Symposium; U of M, Minneapolis; CONTACT: CME, U of M, Box 293 Mayo Memorial Building, 420 Delaware St. S.E., Minneapolis, MN 55455; 612/373-8012.

4 Semi-Annual Meeting, MN Surgical Society; Minneapolis, MN; CONTACT: Charles L. Barbee, M.D., 1000 E. 1st St., Ste. 203, Duluth, MN 55805; 218/727-7259.

5 Fall Seminar — Minnesota Society of Clinical Pathologists; Phillips Wangenstein, University of Minnesota; CONTACT: Eugenia Kassar, 2221 University Avenue, S.E., Suite 400, Minneapolis, MN 55414; 612/378-1875.

5 Minnesota Society of Anesthesiologists — Fall Meeting; L'hotel Sofitel, Minneapolis; CONTACT: David E. Byer, M.D., 200 1st Street S.W., Rochester, MN 55901.

6 ENT for Primary Care Physicians; Mayo Clinic Rochester; CONTACT: Postgraduate Courses, Mayo Clinic, 200 1st Street, S.W., Rochester, MN 55905 507/284-2085.

7 Problems in OB/GYN and Endocrinology; The Duluth Clinic; St. Mary's Hospital Auditorium; CONTACT: James Brueggemann, M.D., The Duluth Clinic, Ltd., 400 E. 3rd Street, Duluth, MN 55805; 218/722-8364.

7-9 Clinical Reviews; Mayo Clinic Rochester; CONTACT: Postgraduate Courses, Mayo Clinic, 200 1st Street, S.W., Rochester, MN 55905; 507/284-2085.

For further information on *future* CME programs, contact CME and Meeting Services, Minnesota Medical Association, 2221 University Ave. SE, Suite 400, Minneapolis, MN 55414, 612/378-1875.

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Interspecialty Council Highlights

Current Activities of the Interspecialty Council

Report on Hair Mineral Analysis

An Ad Hoc Committee of the Interspecialty Council prepared a report on the scientific validity of hair mineral analysis and on claims that can be used to detect nutritional deficiencies. Hair mineral analysis is being advertised to the lay public by a number of commercial laboratories across the country. This technique is a good research tool and may be useful as a screening tool, but should not be used for diagnostic purposes in everyday clinical practice because of difficulties in standardizing the techniques used and in interpreting the results. The report was adopted by the MMA Board of Trustees.

MMA Policy Statement on Ambulatory Procedures

The statement, developed by Interspecialty Council and approved by the MMA Board of Trustees, endorses the concept of outpatient surgery as a potentially effective means of containing health care costs and encourages physicians to select this option whenever possible without jeopardizing quality of care. It expresses several concerns that physicians have concerning rigid lists of ambulatory procedures, the need for utilization review and quality assurance mechanisms, and the unavailability of appropriate facilities. It mentions the competitive marketplace and reimbursement incentives as effective ways of increasing the scope of ambulatory care practice. The Interspecialty Council encourages individual specialty societies to continue ongoing internal dialogue and education concerning guidelines for ambulatory care within their respective specialties.

Specialty Society Caucus

12:30 p.m., Wednesday, May 18, 1983, Radisson South Hotel. This is the second year that specialty societies have the opportunity to appoint voting delegates to the MMA House of Delegates, which will meet May 18 and 19, 1983. Delegates from the specialty societies will be caucusing during the Annual Meeting in order to gain a better understanding of issues coming up before the House pertinent to specialty interests. The caucus will serve as a forum to develop consensus positions which will be presented as these reports and resolutions are debated.

Minnesota Epilepsy Education Center

Upon Interspecialty Council recommendations, the MMA has endorsed the establishment of a Minnesota Epilepsy Education Center at the University of Minnesota. The endorsement carried the stipulation that the private practicing community be involved in the development and administration of the Center, which will provide both patient education and continuing medical education. The Center has been proposed by the Minnesota Advisory Task Force on Epilepsy. This Task Force was commissioned by the Legislature to study the needs of epilepsy patients in Minnesota. A questionnaire to physicians in Minnesota who care for epilepsy patients in order to determine educational needs was sent out by the Task Force. The Interspecialty Council provided some input into its content and facilitated its mailing. The Minnesota Epilepsy Education Center will replace the educational activities of the Comprehensive Epilepsy Program (the Program's educational activities lose their funding in October of this year). Although the Legislature has been asked to endorse the center, funding will be obtained from private sources, not state monies.

INTERSPECIALTY COUNCIL HIGHLIGHTS

Other MMA Activities

Legislative Priorities

The Board of Trustees has approved priorities for the current session as recommended by the Committee on Legislation. High priorities for support include: the establishment of a fund for the cleanup of hazardous waste, portions of a bill which establishes a price-based system of payment to nursing homes, and a bill allowing Mayo Foundation to grant medical degrees. A high priority for opposition is a bill prohibiting the use of pound animals for experimentation. A number of other legislative issues were identified and assigned medium or low priority. Both the seriousness of the issue and the likelihood of success in MMA lobbying efforts were considered in determining priorities.

Health Care Services for the Unemployed

The MMA is encouraging component societies to issue press releases concerning physicians' traditional efforts to provide free or payment-delayed care to their unemployed patients. The MMA Board of Trustees has developed a state-wide program to coordinate and stimulate mechanisms for providing care to the unemployed.

If you have any questions concerning the above, please contact your Interspecialty Council representative.

Interspecialty Council Representatives

MN Allergy Society William Schoenwetter, M.D., 612/927-3091	MN Association of Ophthalmology Raymond Croissant, M.D., 612/927-7138
MN Society of Anesthesiologists Russell H. Larsen, M.D., 612/373-8826	Minnesota State Orthopedic Society Joseph Zeleny, M.D., 612/251-4170
MN Dermatologic Society John Stansbury, M.D., 612/339-3095	MN Society of Clinical Pathologists Richard W. Anderson, M.D., 612/221-1719
MN Chapter, American College of Emergency Physicians James R. Bishop, M.D., 612/924-5000	MN Chapter, American Academy of Pediatrics Lowell W. Barr, M.D., 507/373-1441
MN Academy of Family Physicians John Sutherland, M.D., 507/284-2511	MN Physiatric Society Lloyd Wood, M.D., 507/284-2011
MN Component, American Society of Internal Medicine Lowell Weber, M.D., 612/333-8883	MN Society of Plastic Surgeons William Carter, M.D., 612/925-1765
MN Society of Internal Medicine Robert Mulhausen, M.D., 612/221-3456	MN Psychiatric Society M. J. Martin, M.D., 507/284-2933
MN Chapter, American College of Physicians James H. Kelly, M.D., 612/252-5131	MN Radiological Society William Chandler, M.D., 612/927-4689
MN Neurosurgical Society Burton Onofrio, M.D., 507/284-2611	MN Chapter, American College of Surgeons John Culligan, M.D., 612/227-7564
MN Society of Neurological Sciences John Gates, M.D., 612/221-3700	MN Surgical Society John Sanford, M.D., 218/722-8364
Association of Neurologists of Minnesota Lawrence Schut, M.D., 612/588-0661	MN Thoracic Society F. L. Rasp, M.D., 612/333-2156
MN Obstetrical and Gynecological Society M. Ismail Barrada, M.D., 612/298-8414	MN Urological Society Thomas Love, M.D., 612/224-7543
North Central Occupational Medical Association Frank Ubel, M.D., 612/733-5181	Robert Christensen, M.D., Chairman, Interspecialty Council 612/445-1305
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Placement of ads by telephone not accepted. We also reserve the right to decline or withdraw advertisements at our discretion. Every care is taken to avoid mistakes but responsibility cannot be accepted for clerical or printers errors.

Cancellation of ads must be made before the 10th of the preceding month's issue.

The Journal is not permitted to divulge the identity of advertisers who have replies sent to box numbers.

GENERAL SURGEON, board certified or eligible, to join 15 doctor multi-specialty clinic in New Ulm, 90 minutes from Twin City metro area. Group includes emergency medicine, family practice, internal medicine, obstetrics and gynecology, orthopedics, pediatrics and general surgery. Associates include oncology, otolaryngology, pathology, radiology and urology. Contact Harold Fenske, administrator, collect — (507) 354-4101.

FAMILY PHYSICIAN wanted for practice in rural Minnesota. Liberal buy in. Practice includes an office 20 miles from well-equipped modern 56 bed JCAH approved hospital. For more information, contact: James G. Lawson, Administrator, Tri-County Hospital, Inc., 418 N. Jefferson, Wadena MN 56482, call collect (218) 631-3510.

OPPORTUNITY FOR qualified physicians at the Albert Lea Clinic, P. A., in Albert Lea, Minnesota. The clinic is a seventeen man multi-specialty group in primary and secondary care fields. The financial rewards are exceptional and practice challenges very attractive. There is a negotiated salary at top level for the first year. Senior physician participation begins at the end of the first year with a incentive income distribution plan plus expanded fringe benefits. The clinic has a low cost buy in with a maximum profit sharing plan. There is a top level insurance program, medical reimbursement program, and a full range of other benefits. A nearly new hospital in the city provides an exceptional place to work. These are choice practices in a delightful place to live. We are currently looking for physicians in Family Practice, in Otolaryngology, one OB-GYN. Please contact B. J. Boss, Administrator, Albert Lea Clinic, P. A., 1602 Fountain Street, Albert Lea, MN 56007. Phone 507-373-8251. Personal phone 507-377-1406 or contact L. E. Shelhamer, Jr., M.D., 507-373-8251 or personal phone 507-377-1530.

OFFICE SPACE FOR RENT: Physician in Loring Park area of Minneapolis wishes to rent part of his office to another Doctor. Six exam rooms, x-ray, lab, procto table, etc. Adjacent to hospital. Call 612-870-8448.

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(Continued on page 524)

Classified Advertisements

(Continued from page 523)

OB GYN to join successful 12 physician practice in Faribault, MN, just 50 miles south of Mpls. on 35 W. 2 general surgeons, 2 internists, 8 family physicians. Busy OB practice. Newly remodeled clinic 5 blocks from modern well-equipped hospital. Guaranteed salary first year, incentive compensation thereafter. Disability, Life, Health, Malpractice insurance paid by the clinic. Profit sharing and pension plan as well as generous vacation and study time. Contact Darral Mischke, Administrator, Faribault Clinic, Ltd., 924 N.E. 1st St., Faribault, MN 55021. Telephone: 507-334-3921.

OFFICE SPACE FOR RENT: Former O.B. G.Y.N. suite in Capitol Medical Office Building attached to Bethesda Lutheran Medical Center in St. Paul. 3,589 sq. ft. includes reception area, 10 exam rooms, lab area, doctors' lounge, nurses' lounge, and 2 private offices. Ready for equipment and patients. Suitable for a variety of practices. Space can be subdivided. Call Dick Keller at Kraus-Anderson (612) 332-1241.

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STAFF PSYCHIATRIST CMHC has an excellent opportunity for a staff psychiatrist. Must be board eligible. Programs include in-patient, out-patient, education and consultation, specialized services to children, the chronically mentally ill, and the chemically dependent delivered in conjunction with a seasoned team of multi-disciplinary mental health professionals including two part-time psychiatrists. Excellent four-season recreational area. Salary and fringe benefits negotiable. Contact: Donald E. Frees, ACSW, Area Program Director, P.O. Box 646, Bemidji, MN 56601. An Equal Opportunity Employer.

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WANTED: Ob-Gyn, family practitioner, pediatrician and internal medicine to join multi-specialty group. One month vacation, hunting, fishing and lake recreation area. Starting salary excellent, many fringe benefits included. Write: MINNESOTA MEDICINE (735), 2221 University Ave. SE, Suite 400, Minneapolis 55414.

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(Continued on Page 528)

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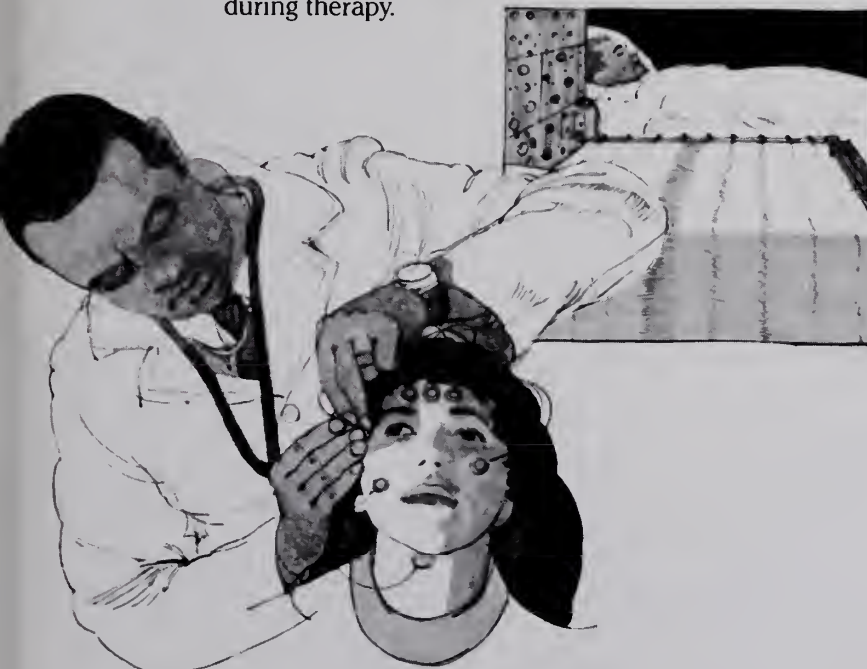
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References: 1. Kales A et al: *J Clin Pharmacol* 17:207-213, Apr 1977 and data on file, Hoffmann-La Roche Inc., Nutley, NJ. 2. Kales A: Data on file, Hoffmann-La Roche Inc., Nutley, NJ. 3. Zimmerman AM: *Curr Ther Res* 13:18-22, Jan 1971. 4. Kales A et al: *JAMA* 241:1692-1695, Apr 20, 1979. 5. Kales A, Scharf MB, Kales JD: *Science* 201:1039-1041, Sep 15, 1978. 6. Kales A et al: *Clin Pharmacol Ther* 19:576-583, May 1976. 7. Kales A, Kales JD: *Pharmacol Physicians* 4:1-6, Sep 1970. 8. Frost JD Jr, DeLucchi MR: *J Am Geriatr Soc* 27:541-546, Dec 1979. 9. Dement WC et al: *Behav Med* 5:25-31, Oct 1978. 10. Vogel GW: Data on file, Hoffmann-La Roche Inc., Nutley, NJ. 11. Karacan I, Williams RL, Smith JR: The

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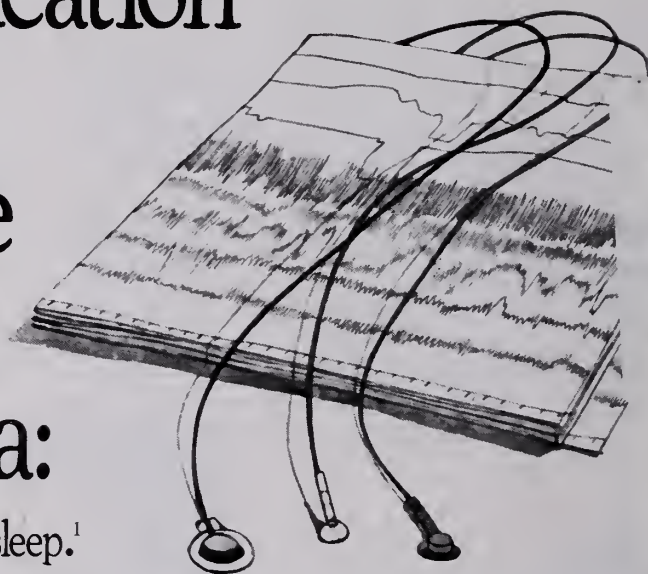
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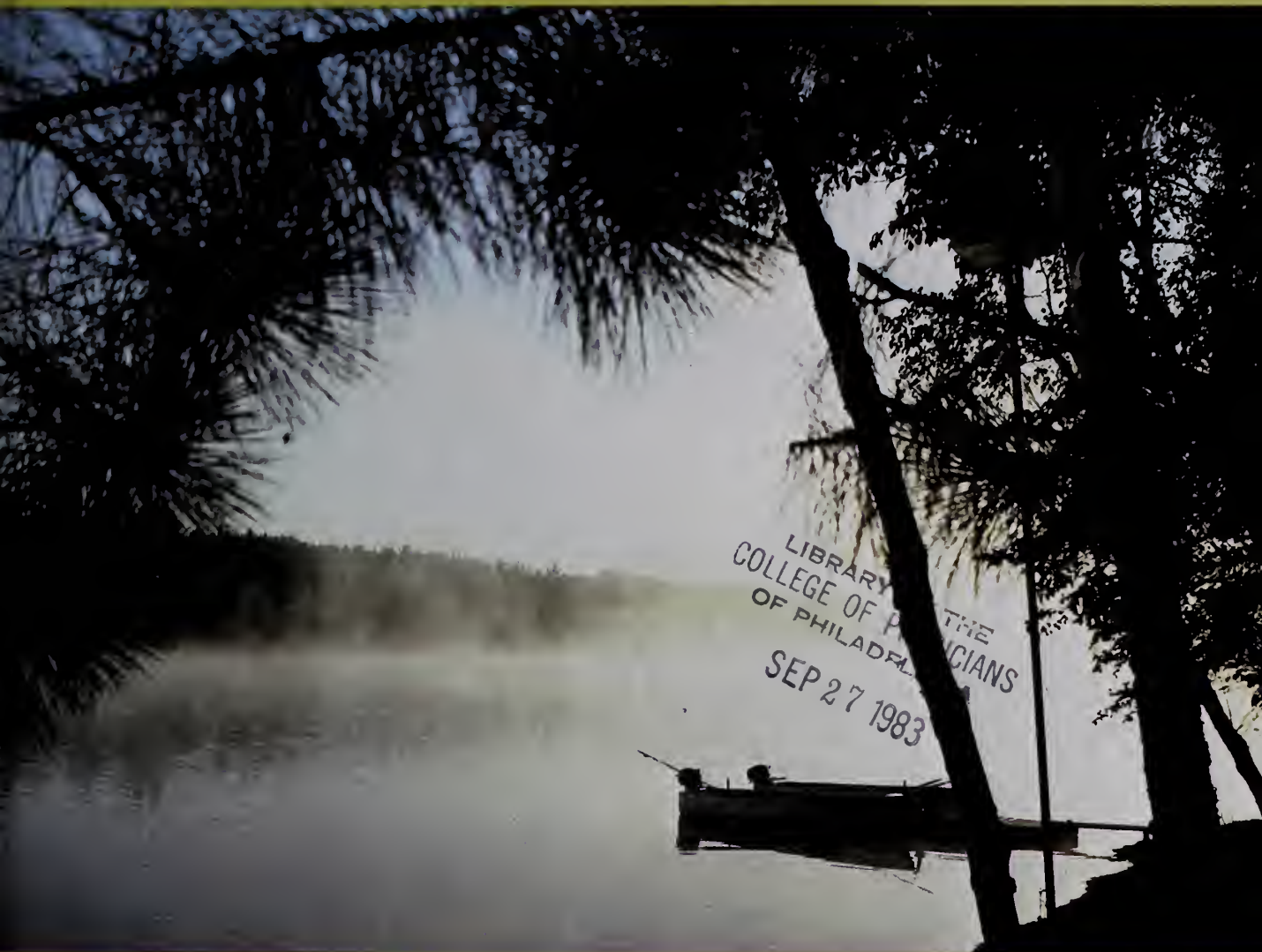
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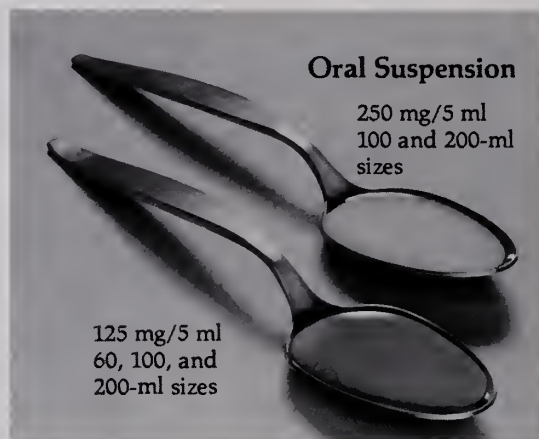
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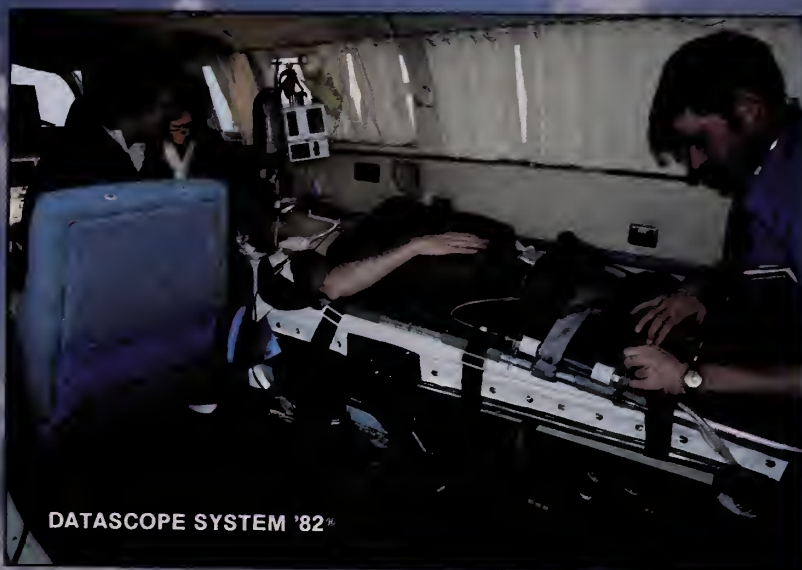
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President's Letter



Treading Where Angels Won't

Fools, according to the old adage, will rush in where angels fear to tread. I make no claim to be an authority on angel behavior or activity, but I strongly suspect that careful observation would reveal very few angel footprints in or around the subject of the definition of high quality in medical care.

I do not take lightly the prospects of being regarded a fool, but I feel a strong compulsion to share some thoughts about the definition of high quality medical care. This compulsion is born of a conviction that the lack of a reasonable working definition of what constitutes quality is detrimental to the public interest. It is also detrimental to the interests of the medical profession. I feel that it has become an accepted truth that quality *cannot* be defined. I have heard many statements to that effect by physicians and other knowledgeable people.

The result of this widely held viewpoint is that it becomes easy for those who would change our medical care delivery system to claim high quality of care as an assumed benefit of their schemes. It also is easy for planners to claim that lower costs will occur from their plans with *no* sacrifice in quality. Where no definitions exist, there is little opportunity to refute those claims.

Before attempting to formulate a definition it would be wise to consider some of the possible reasons why it has been so difficult to define quality in medical care. One factor, I believe, is the complexity of medical care as a service. It is the most complex of all human services, probably by a factor of several fold. The subject matter of medical science is complex but probably not much more so than other intellectual disciplines such as nuclear physics, but as a *human service* it has no peer in complexity. When the nuclear physicists devise a theory that quarks are the fundamental particle of which protons are constructed, this knowledge does not become trans-

formed into a service or technology that is applied to human beings and made part of their behavior pattern as does occur when there are advances in medical knowledge. In other words, nuclear physics does not have to be marketed.

Another difficulty in the defining of quality in medical care lies in the concept of a definition itself. To define something seems to entail a concept of precision — of sharply drawn lines of demarcation. It would seem that it would involve deciding that in a certain circumstance to do a urinalysis would be high quality care and to not do it would be poor care. Though this frame of reference is certainly a part of the concept of quality, it is more realistic to regard medical care as a dynamic process involving an interaction between doctor and patient, doctor and the information at hand, patient and medications, etc. If we seek to have our definition in terms of dynamics, we are more apt to come to a meaningful and useful conclusion that can be applied to medical care quality assessment.

Another consideration pertaining to quality assessment is that there are different perspectives from which quality is being judged. In the individual case, the question of whether care that was rendered was of high quality is of concern to the individuals involved, sometimes to the courts, and occasionally to the hospital staff in the context of a teaching exercise.

In a somewhat broader context, the question regarding whether an individual physician or an institution practices a high quality of care is of concern to hospital staff discipline or credentials committees or to licensing boards.

In these two contexts, quality of care can only be judged by a peer review mechanism. There is an analogy here, I believe, with the judgment of quality in the performance of a piece of music by an artist. Only a group of concert violinists could really judge

whether a given performance of a violin concerto was of high professional quality. A concert goer may thoroughly enjoy the music yet not be able to judge its performance standards. A list of specific rules for the performance of this concerto might be drawn up, but the real essence of the music cannot be captured in such rules. The medical profession has supported and implemented peer review for many years.

In a broader context I offer the idea that medical care can be regarded as occurring in a framework of four sides. Each side of the frame denotes an element of care and a basis for interaction between the care given and the patient. In three of the four sides, there are elements of both quality and quantity of care given that impact on the patient.

The bottom frame, which serves as a foundation for medical care, is knowledge and technology based on the scientific method and its associated inductive and deductive reasoning process that we apply to the diagnosis and treatment of our patients. We all use empiric treatment at times, but we do not use or justify the use of treatment or testing which is not rational or consistent with current scientific knowledge. Departure from this standard constitutes poor care. Failure to apply this knowledge and technology when it would be beneficial to our patients to do so also constitutes poor care.

One of the vertical frames is that which denotes the spectrum of humanistic aspects of medical care. No effort will be made here to draw up a complete list, but it would include gratification of the patient's dependency needs and other emotional factors, protection of the patient's legal rights, and the area of communication regarding medical care. Medical care which respects these needs and seeks to fulfill them is from this perspective high quality care. That which ignores these factors is not high quality even when it is scientifically sound.

The other vertical frame is the economic perspective of medical care. As an element of quality, it basically consists of the concept that tests and treatment only be administered if they can be reasonably expected to make a difference in the course of the management of the clinical problem. The physician must avoid duplications and any other form of waste such as tests to satisfy intellectual curiosity alone. This constitutes a change in our perception of quality. We all have been taught that a certain degree of redundancy of technology is consistent with high quality care. In this new view of quality, unless each test done has a clearly defined plan of action related to the potential result, the performance of the test would constitute poor quality of care. It is equally true that

avoidance of tests and treatments that would have important clinical implications, because of economic considerations, constitutes poor care.

The top horizontal member of this quality frame work consists of the concept of individuality. Here, the central thesis is the concept of flexibility in the application of medical care to fit the needs of each person. This is the place for the art of medicine. The antithesis of this aspect of quality are regimentation, algorithmic approaches to the care used as rigid criteria rather than guidelines, etc.

The potential value of this framework concept of quality is that it should help us to evaluate or predict the effects of changing practice environments or economic and social pressures that impact on the health care we deliver. Scientifically-based care, rendered frugally with humanistic concern and tailored to individual needs, is high quality. Some proposed delivery system changes have the potential of facilitating increased quality of care while others are apt to decrease its quality. It is our responsibility as physicians to inform the public of these effects on quality.

There is a third dimension to the health care experience that is a part of reality and therefore, is a part of quality and cost consideration. That dimension is time. In reality, this square frame is a four-sided tunnel which the individual enters during which time the individual becomes a patient. This term, which is being abandoned by some people who would prefer to use the term "client," denotes a relationship with doctors, nurses, and other professionals that is different from most other relationships. The patient is interacting with the four elements of care from a basically dependent posture. The longer the individual is in this "tunnel" the more demanding a task it is to keep the quality of care high. One stabilizing factor in this experience is the continuity of relationship with providers that we know to be so important. Therefore, systems of medical delivery in which over a period of time there is a rapid turnover of medical care personnel, is apt to become deficient from this aspect of interactions over a period of time. At the risk of being redundant I want to re-emphasize that the experience that a patient has cannot truly be comprehended from the viewpoint of certain things that are done to or for the patient by certain people. Rather, over a period of time, be it a 15 minute office visit or a long hospitalization, the individuals set aside most of their coping mechanisms and undergo an experience in which they interact with treatment, interact with the people who are delivering their care, and interact with the disruption of their lives both economically and from a standpoint of the normal flow of

PRESIDENT'S LETTER

events. This by definition is a dynamic process, and if we are to successfully define its quality we must seek that definition in terms of dynamics.

The nuclear physicists have struggled for decades to establish a unified field theory (the perception that fundamentally everything in existence has a common denominator). Recently they informed us that they now have solid theoretical and experimental evidence that just after the Big Bang everything — matter, energy, electro-magnetism, gravity — was *one* thing. We do not have a word to describe what that “thing” was.

This state of affairs lasted for one ten million billion billion billionth of a second (10^{-43}). This is probably about the length of time that my “unified

theory of high quality medical care” will last when my colleagues analyze it, but no matter. If, by setting aside my ideas, better ones are brought to bear on this issue my purpose will have been served.

We must find a way of defining the quality of medical care. How else can we refute those who would proclaim that you can buy high quality medical care in a dime store?

Besides, it is lonely here without those angels.



Donald C. Bell, M.D.
President

Minnesota Medical Association

Child Abuse and Neglect Symposium

A symposium for Minnesota physicians dealing with child abuse and neglect has been scheduled for October 7-8, 1983 at the Mayo Clinic, Rochester.

The symposium has been organized by the Minnesota Department of Public Welfare in cooperation with the Mayo Clinic, and the Minnesota Medical Association and Ross Laboratories, a Columbus, Ohio, pharmaceutical firm, as a continuing education program for physicians.

Topics include the role of juvenile courts, fetal alcohol syndrome and effects, child pornography, relationship of failure to thrive to child neglect, adolescent victims, and community based prevention programs. Among the presenters will be Dr. Robert ten Bensel, a nationally known expert on child abuse, and Doctors Thomas Cress, Daniel Broughton, Carolyn Levitt and Robert Blum; Minnesota Special Assistant Attorney General Diane Masters; Olmsted County Judge Gerard Ring; Olmsted County Attorney Raymond Schmitz; and Nancy Berg, Minnesota State Bar Association Child Abuse Committee.

Continuing medical education credits can be obtained through the Mayo Clinic, Mayo Foundation and credit toward CME hours prescribed by the American Academy of Family Physicians.

Contact: Maureen Cannon, Minnesota Department of Public Welfare, Centennial Office Building, 658 Cedar St., St. Paul, MN 55155 or Dr. Daniel Broughton, Department of Pediatrics, Mayo Clinic, Rochester, MN 55905.

PALS Course Offered by Children's Hospital

Pediatric Advanced Life Support (PALS) course will be offered October 27 and 28 in St. Paul by the Emergency Services Department of Children's Hospital of St. Paul.

The course provides a complete education program in the first hour of care for critically ill or injured children. The training is designed for physicians, nurses and paramedics.

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Editor's Notebook

Born to Struggle

"No matter what happens in the future, this certain Polish nature will remain. It's like a genetic defect. You are born to struggle."

*Jurek Janeczek, Actor in "Bridal
Polonaise," A Play about Life
in Modern Poland*

July 26, Hartford, Connecticut — This morning I went to the funeral of my son's godfather, Doctor Jerzy Sikorski, a Polish-born pathologist with whom I trained. This afternoon I spoke about DRGs (Diagnosis Related Groups) with physicians and administrators at Hartford Hospital, a 900-bed teaching institution. These morning and afternoon activities may strike you as unrelated, but for me they are linked. At least that's what I hope to establish in this tribute to Jerzy.

Son of Poland and Citizen of America

Poland is a proud country with cultural roots going back a thousand years. For the last 200 years, because of the country's unfavorable historic and geographic position, Russians or Germans have shoved Poles back and forth across Europe. This experience has seared into Polish souls a certain fatalism. As a Pole, you know you are born to struggle.

Jerzy, or George as I knew him, struggled. In 1944, when he was 19, the Nazis wounded his father in the Warsaw Uprising and put his brother in a concentration camp, where they murdered him. Even before the uprising, George was an active member of the Polish underground army. After the war, by one of the twists of fate, he studied medicine in Germany, a country he never forgave (when I bought a German car, he chastized me by saying; "How could you ever do that?"). He stopped medical school after two years and came in 1950 to Connecticut, where he worked in a factory until 1954 making precision parts for airplanes. Then, armed with enough factory money to educate himself but not enough to take his wife, he returned to Europe where he attended medical school at the University of Basle in Switzerland, finishing there in 1957. The next four years were devoted to working his way through a pathology residency in the United States. During his residency, he learned he had acromegaly. For the next 20 years, he fought against the ravages of that disease, which coarsened his features, weakened his physical capacity to practice, and shortened his life.

Nothing Easy

As you see from what I've said so far, nothing came easy for George. He didn't expect it to. Even English came with difficulty. His keen thoughts didn't always translate well into English. His wife said to me: "If you could only hear George speak in Polish, you would know how eloquent and profound he is."

I knew already. As a fellow resident in pathology, George quietly, quickly, and simply taught me the main tricks of the trade. Besides, other clues to his intellect kept cropping up. He achieved the highest score among foreign-born physicians in Connecticut who took the Foreign Medical Graduate Examination. And he breezed through the Pathology Board examinations.

His Heritage

When he became an American citizen, George was proud and grateful. He and his wife had chosen this country and set about the task of raising three sons. But they never neglected their heritage. To be of Polish descent was a source of deep pride, and he remained loyal to Connecticut's large Polish community, which numbers over 100,000.

His heart, already enormous from acromegaly, swelled with pride when Catholic Cardinals selected the first Polish Pope. And it nearly burst when ten million Poles, backed by their Church, formed Solidarity and took on Poland's communist government.

Sense of Realism

Somerset Maugham, the English novelist and himself a physician, once wrote that nothing brings you so close to realism as medicine. Because he was a physician and because of what he had gone through, George was a realist and a skeptic. He deeply distrusted bureaucracy in any guise. Too often he had seen bureaucrats manipulate and limit citizens. Perhaps this is what made him so leery of the United States government's attempts to limit health care spending by limiting length of stay, limiting costs, limiting beds, and limiting fees. The very word "limits" distracted from his vision of America, the land of opportunity. With "limits", he said medicine wasn't fun any more.

DRGs

But he probably knew federal largess had to end. From 1960 to 1983, U.S. spending on health care — thanks to Medicare, Medicaid, and favorable tax treatment of health care costs — jumped from \$27 billion to \$360 billion, outpacing the GNP growth by nearly three times. He must have seen the handwriting on the wall when the Yale University Medical Center, scarcely ten miles away from his home hospital, conducted government-supported DRG studies in the mid-1970s. The idea of an all-inclusive system that pigeon-holed all acute hospital patients into 383 categories (there are now 467 categories) was irresistible to the government. After all, with such a powerful limiting tool, you could set prospective limits on each patient's *entire* stay and pay *one* bill on discharge. No more worry about controlling ancillary services. No more separate charges for routine costs. And what a clean way of recognizing and documenting differences in case mix and severity among hospitals.

Another Struggle

George knew DRGs would be just another struggle, this time against the limited mentality of the U.S. government. I doubt if he was impressed with the DRG concept. For one thing, he would have envisaged the cumbersome bureaucratic machinery — the burgeoning DRG software, the endless administrator-physician meetings, the proliferating DRG "coordinators," and the emergence of data processing people as hospital kingmakers. All of these would be required to "limit" and "control" case costs and case mixes.

Besides, George was a humanist. He believed you best treat patients as humans in a personal context, rather than as a product in a diagnostic category. He would rather be known as a complete human being than as a DRG 123 (circulatory disorder, acute myocardial infarction, discharged dead, medical) with a low trim point of one day and high trim point of 10 days. He knew you could never reduce the multiple dynamic complexities of modern medical care of flesh and blood to a static single number.

Realist to the End

But as a realist, he would have seen the truth to these words:

"The open-ended era of federal health care finances is coming to an end. It was inevitable that it would. Federal revenue losses are too large and growing too fast

EDITORS NOTEBOOK

for it to be otherwise. . . . Give or take a year or two . . . 1983 or 1984 is likely to be the year the music stopped."¹
Sooner or later, the music stops for all of us.

Richard L. Reece MD

Reference

1. Enthoven, Alain, C: "The Year the Music Stopped," from a speech to the American Academy of Orthopedic Surgeons, March 12, 1983, Anaheim, California.

Resource Group on Rheumatic Diseases Presents

Rheumatology Seminar V
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Children's Hospital — St. Paul

Pediatric Conferences

Sept. 22	"Newer Developments in Bacterial Vaccines"	G. Scott Giebink, M.D., University of Minnesota
Oct. 13	"New Trends in the Management of ITP"	John Priest, M.D., Children's Hospital of St. Paul
Oct. 20	"Balloon Dilatation of Congenital Cardiac Defects: A New Approach"	James Lock, M.D., University of Minnesota
Oct. 27	"Diabetes and Nephrotic Syndrome"	Robert Vernier, M.D., University of Minnesota; and Stanley Leonard, M.D., St. Paul

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Thoracic Actinomycosis Mimicking the Pancoast Syndrome

CARL EIBEN, M.D.*; FRANK J. INDIHAR, M.D., F.A.C.P.† and
SAMUEL W. HUNTER, M.D., F.A.C.C.P.‡

A case of thoracic actinomycosis presenting as a chest mass and mimicking the Pancoast Syndrome is discussed. A selective review of recent literature on the subject of thoracic actinomycosis is presented. Although rare, actinomycosis is a diagnostic possibility in a patient who presents with a chest mass and constitutional symptoms such as fever and weight loss. Surgery is often necessary to establish the diagnosis and to rule out malignant disease. Treatment with a long-term high dose Penicillin is indicated. Prognosis is good with adequate antibiotic therapy.

THE CASE is one of a 54-year-old white female who complained of a six month history of almost continuous sharp left sided neck and facial pain which gradually extended into the left shoulder and arm. She further complained of a recent increase in cough and sputum production. She denied weight loss, shortness of breath, and hemoptysis. She had a history of multiple dental problems and had had extensive dental work performed over the past two years. The patient denied allergies but had a thirty-four pack year history of cigarette smoking. There was a good possibility of vomiting and aspirating gastric content into the lung.

Physical Examination

On physical examination the patient was in no acute distress. Vital signs were stable. Examination of the HEEN&T revealed poor dentition with multiple carious teeth. The chest was clear to percussion and auscultation. The cardiac examination was unremarkable. There were well healed abdominal surgical scars from a previous cholecystectomy and pelvic surgery. The neurological examination showed decrease strength (grade IV/VI) in the left deltoid and infraspinatus. There is decreased sensation to pin prick in the C5 dermatome with normal deep tendon reflexes in the left upper extremity. An EMG of the left upper extremity, however, was essentially normal.

Laboratory studies on admission were within normal limits with the exception of the following: the CBC which showed a mild microcytosis; alkaline phos-

phatase was increased as was the serum GGT; serum iron was decreased. Sputum cultures showed normal flora and sputum cytology was negative for malignant cells. A chest Xray revealed a large mass in the apex of the left lung, adjacent to the mediastinum, causing elevation of the left hilus (Figure 1). There was no bony or soft tissue involvement noted on the chest Xray. The differential diagnosis at this point included

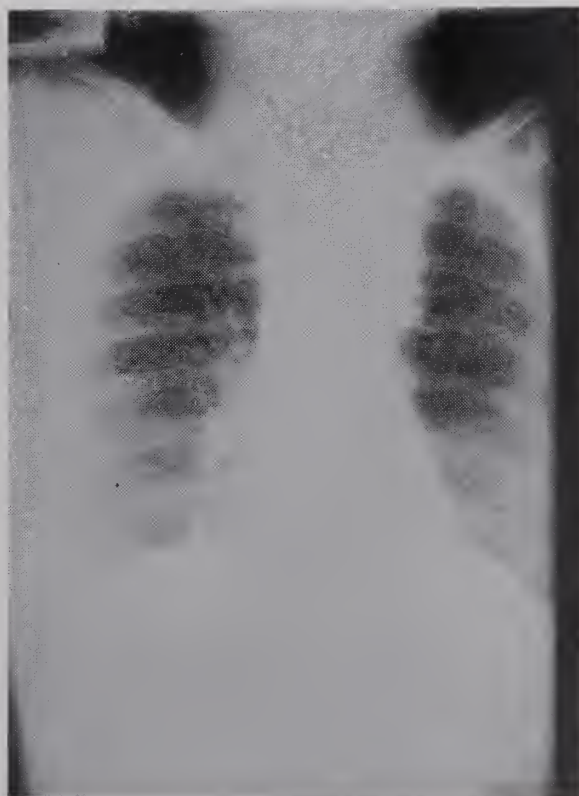


Fig. 1 — Admit PA Chest Xray.

*Resident, Department of Physical Medicine and Rehabilitation, University of Minnesota Medical School, Minneapolis.

†Clinical Assistant Professor, University of Minnesota Medical School, Departments of Internal Medicine and Family Practice and Community Health, Minneapolis.

‡Clinical Assistant Professor, University of Minnesota Medical School, Department of Surgery, Minneapolis.

From: Bethesda Lutheran Medical Center, St. Paul, Minnesota

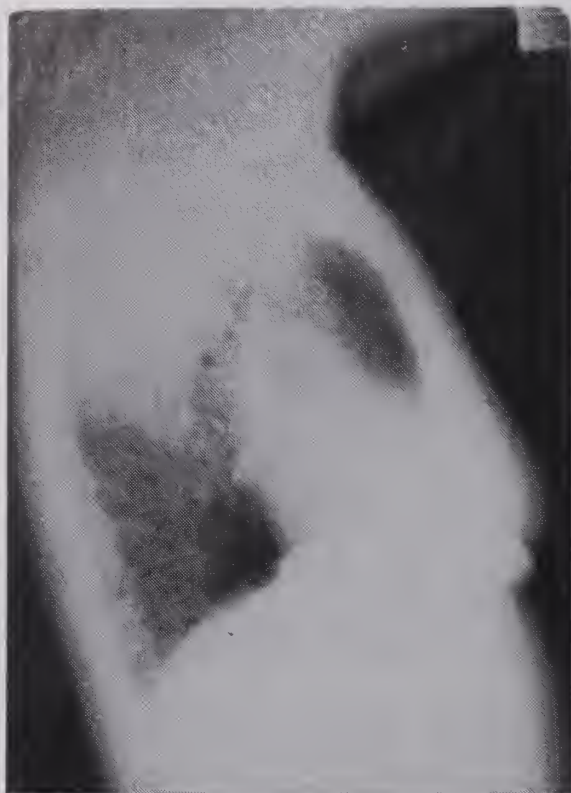


Fig. 1 — Admit Lateral Chest Xray.

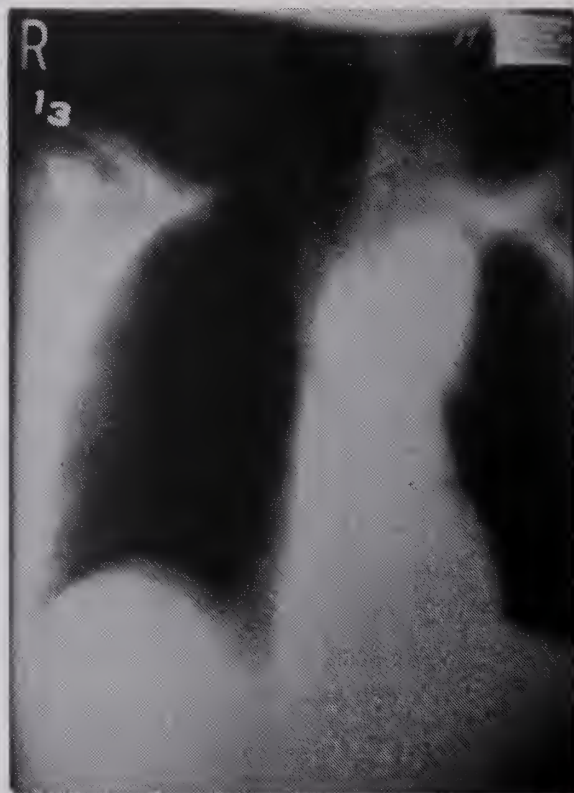
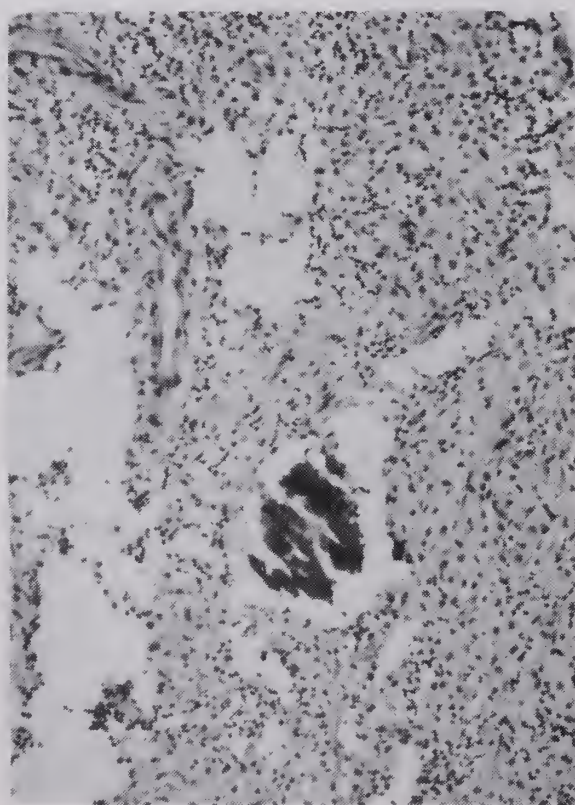
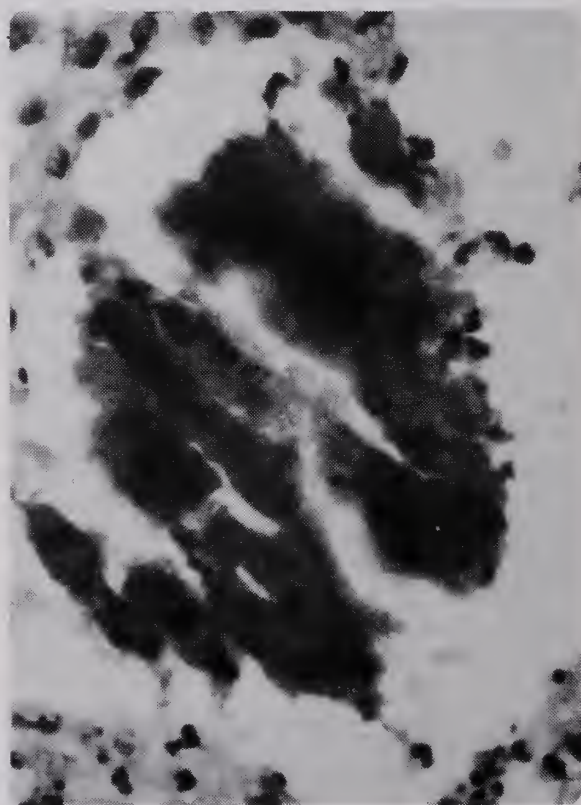


Fig. 2 — Tomogram of Left Apical Mass.



(400×)



(1000×)

Fig. 3 — Sulfur Granule Tissue Gram Stain.

neoplasm, inflammatory lesion, or vascular abnormality. Tomograms of the area defined the mass and demonstrated tracheal deviation (Figure 2); an arch aortogram showed a normal aorta. The working diagnosis at this point was a lung neoplasm with possible extra-pleural invasion.

Hospital Course

Because of the strong possibility of malignancy, an open lung biopsy was performed. The left upper lobe was found bound to the pleura by the suspect tumor. The process had extended into the neck to involve the brachial plexus and across the major fissure to involve the left lower lobe. The frozen sections, including two pleural biopsies and four lung biopsies, showed benign inflammatory and fibrous tissues with no malignant tissue identified. The permanent sections revealed "extensive areas of chronic and superimposed acute pneumonia with fibrosis and repair reaction", with numerous focal micro abscesses (Figure 3). Fungal stains demonstrated the presence of aggregates of radiating small branching filaments highly suggestive of Actinomycosis (Figure 4). All sections were negative for any malignant tissue. Aerobic cultures yielded gram negative rods resembling *Actinobacter calcoaceticus* with the anaerobic cultures demonstrating many gram positive slender branching rods. The final identification from the Minnesota State Board of Health laboratory was *Actinomycosis israelii*.

The patient markedly improved following a three week course of 20 million units of Penicillin G i.v. daily. This is being followed by a three month course of oral Penicillin in a dose of two grams daily.

Discussion

Actinomycosis is a 'true' bacteria related to the *Mycobacterium*. It is an anaerobic or microaerophilic gram positive pleomorphic rod that is non-acid fast under most circumstances. The usual species identified in man is *Actinomycosis israelii*, the species never being isolated from non-human or non-animal sources. It is non-transmissible but is a normal habitant of the mouth. All ages are involved but the male to female ratio is 2:1. The organism causes a chronic systemic or localized infection with a tendency to abscess, sinus and fistula formation. Actinomycosis can normally be found in the gingiva, tonsillar crypts and in the gastrointestinal tract, and becomes a pathogen when mucosal barriers are disrupted following trauma or dental procedures. Spread of the disease may be quite aggressive as sinuses and fistulae cross connective tissue barriers. Local concentrations of the bacteria

form the class sulfur granules or ray fungus which are only found in affected humans (Figure 4). The disease is usually limited to local spread but blood born infections do occur.¹

The clinical manifestations vary with the site of the infection. The cervico-facial and abdominal sites are the most common, each occurring 25% of the time. Pulmonary infections are next in incidence, occurring 15% of the time. The remainder of the cases are scattered among other body sites including the brain, liver, genitourinary tract and heart. The cervico-facial disease usually follows dental procedures; pulmonary involvement is most likely secondary to aspiration with direct extension from the neck being less likely.² Flynn found 15 of 85 cases of cervical Actinomycosis with secondary involvement of the chest.³ With pulmonary involvement, symptoms include productive cough, low grade fever, weight loss and hemoptysis with a tendency for empyema formation. The disease may then spread to the chest wall and involve the ribs. Chest wall abscesses are also common with eventual sinus formation. Abdominal Actinomycosis, (commonly presenting as an anorectal fistulae,) usually follows a ruptured appendix.

Laboratory findings are non-specific and include a mild leukocytosis and anemia. The sedimentation rate

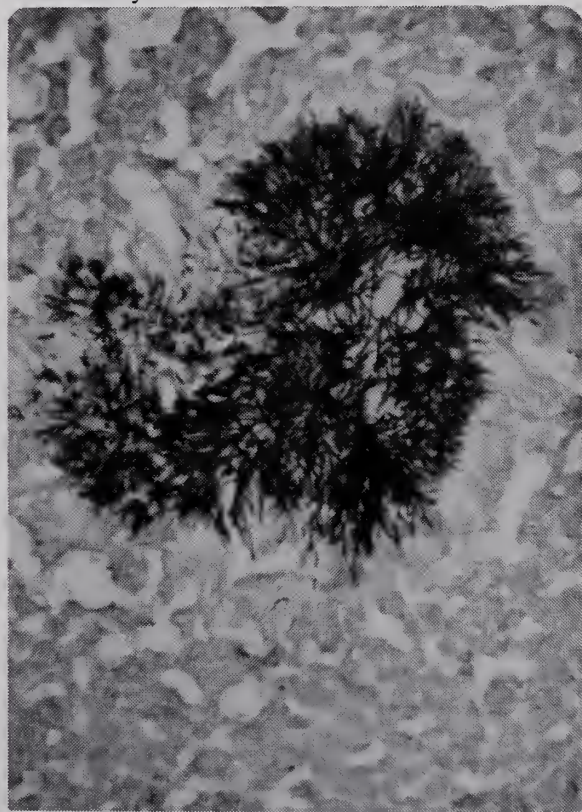


Fig. 4 — Sulfur Granule Methenamine Silver Stain.

may or may not be elevated.² Diagnosis is based on direct culture of the organism. Sputum cultures are of little diagnostic help because the organism is a normal inhabitant of the upper respiratory tract. Successful culture then depends on recovery of the organism from a transtracheal aspirate, culture of empyema fluid, or direct biopsy. In one series from the Mayo Clinic, 16 of 18 cases were diagnosed by thoracotomy and biopsy.⁴

Prior to the availability of antibiotics, pulmonary Actinomycosis was treated with surgical resection and drainage; prognosis for recovery was poor. With the advent of antibiotics such as Sulfa and Penicillin, however, the outlook for the cure was greatly improved. Current recommendations for treatment include aqueous Penicillin G 10-20 million units per day for three to six weeks followed by oral Penicillin for three weeks to six months depending on the severity of the disease and the response to Penicillin. It may also be necessary to drain abscesses and resect involved ribs in different cases. In Penicillin allergic patients, Tetracycline two grams daily may be

substituted.

With adequate antibiotic therapy, prognosis for recovery is good. 90%, 80% and 86% recovery has been reported for cervicofacial, abdominal and pulmonary actinomycosis.^{1,5} Somewhat poorer results can be expected for pulmonary actinomycosis with empyema. Deaths are rare with adequate treatment; with only one death since 1958 in a recent series.²

Summary

An unusual presentation of thoracic Actinomycosis is discussed presenting with symptoms mimicking the Pancoast Syndrome. Because of the likely possibility that a chest mass of this type represents carcinoma, surgery is often necessary to rule out malignant disease. With the absence of the malignant cells in biopsy specimens, appropriate anaerobic cultures should be obtained to rule out this rare disorder. Treatment is generally successful with long-term administration of appropriate antibiotics.

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Rheumatoid Arthritis and the Kidney — Schlesinger (page 549).

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Myocardial Infarction Patient in a Small Town Hospital

LEE J. COHEN, M.D.*

An 18-month review of myocardial infarction patients was undertaken in a small town hospital. The total mortality of 18.8% compares favorably with other recent studies despite an average patient age of 72 years. Other advantages of small hospital coronary care are discussed.

SINCE THE ADVENT of the modern coronary care unit (CCU), there has been much discussion among rural physicians and their patients as to the proper setting in which to care for the patient with a myocardial infarction. Small rural hospitals usually have no CCU, while perhaps offering a more modest level of intensive care. These hospitals are often staffed by family physicians, and the nursing staff is trained in the management of all aspects of patient care, rather than just coronary care.

Can the patient with a myocardial infarction be adequately cared for in such a setting, or would it be more appropriate that such patients be transferred to larger hospitals with fully equipped CCUs?

There seems to be a definite improvement in the outcome of the myocardial infarction patient since the introduction of modern coronary care units.¹ Most younger physicians have been trained to work in such units and easily assume them to be the proper setting for treating myocardial infarction.

However, there are advantages to avoiding transfers of patients with acute infarction, as well as benefits of care in the local community, close to the family, by physicians known to the patient. Also many CCU techniques, such as a rhythm monitoring and nurse initiated defibrillation, are not difficult to introduce in even the smallest hospital. The much greater expense of patient care in the CCU is becoming a factor of increasing importance.

Background

Lake View Memorial Hospital is a 30 bed general hospital located in Two Harbors which has a population of 4,000 and surrounding population of 13,043.

Coronary patients are cared for in one room

(immediately adjacent to the single nurse's station) with cardiac rhythm monitoring. If necessary, two beds can be placed in this area. Patients are usually cared for in the monitored room for several days and then transferred to usual hospital care.

The nursing staff, in addition to caring for the cardiac patients, is responsible for care of pre and post operative patients, obstetric patients, general medical patients and the emergency room.

The census averages 13.6 patients with usually two R.N.s on duty at a time. A Registered Physical Therapist works with patients on cardiac rehabilitation.

The attending medical staff consists of all family or general physicians, with the exception of one Board Certified General Surgeon. Most of the physicians on the staff participate in the care of cardiac patients. There is always a physician on call.

A consulting radiologist and pathologist visit the hospital weekly, and EKGs are sent to a group of internists in Duluth for formal interpretation. Duluth, 25 miles away, also offers two hospitals with CCUs for transfer of patients if necessary.

Methods

A chart review was made of all patients admitted during a 18 month period between November 1980 through May 1982, with the diagnosis of myocardial infarction. An appropriate clinical presentation supported by either diagnostic EKGs or serial cardiac enzyme rises (including CPK-MB) or both was required to verify the diagnosis.

The patients were divided into two groups, those whose myocardial infarction ran an essentially uncomplicated course and those whose demonstrated at least one recognized complication of acute myocardial infarction. In one case the only complication was extreme patient denial of the illness with lack of compliance with the medical regime. He

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Acknowledgment: Gloria Blankenship, A.R.T., Director, Medical Records, Lake View Memorial Hospital, Inc., Two Harbors, Minnesota.

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was included among the cases with complications

The following charts summarize the clinical characteristics of these 32 patients.

Summary of Results

I Mortality	
Total Deaths in Hospital	18.8%
Deaths within first 24 hours	9.4%
Deaths within 2 months of discharge	6.3%
II Complications	
Cases with Complications	59.4%
Cases without Complications	40.6%
III Age Statistics	
Overall Average	71.9 years
Average uncomplicated cases	67.8 years
Average Complicated Cases	74.6 years
Average in Fatal Cases	76.9 years
IV Transfers	
Medically necessary	6.2%
One patient was transferred because of a family request.	
V Average Length of Hospitalization	
Complicated cases	11.1 days
Uncomplicated Cases	11.3 days
Fatal Cases	8.0 days

Breakdown of Total Hospital and Physician Charges

	Average Length of Stay	Average Hospital Bill	Average Physician Bill
Uncomplicated (N = 13)	11.2 days	\$2022	\$199.65
Complicated (N = 19)	10.7 days	2406	270.05
Total	10.9 days	2250	241.45

The Fatal Cases are summarized:

71-year-old female with no past cardiac history. Autopsy confirmed a massive posterior wall infarction with thinning of the ventricular wall and aneurysm. This patient developed pulmonary edema and hypotension within hours after admission with no response to Lasix and Dopamine infusion. There was evidence of continuing pain and death less than 24 hours after admission.

72-year-old female. Her past history included prior myocardial infarction, two admissions for myocardial ischemia, congestive heart failure and atrial fibrillation. Despite IV Lidocaine she developed bigeminy six hours post admission which rapidly deteriorated to asystole. Resuscitative efforts and defibrillation failed.

96-year-old female. She survived the initial myocardial infarction but developed progressively severe congestive heart failure not responsive to Digitalis and diuretics, dying nine days after admission.

81-year-old female. This lady had Class IV heart disease before her infarct. After infarction her congestive heart failure with pulmonary effusion did not respond to Digitalis and large doses of Lasix.

70-year-old male. Past history of cerebrovascular

accident. This patient had evidence of re-infarction on day #3 with continuing pain thereafter. Progressive congestive heart failure developed with terminal hypotension despite Digitalis, Lasix and Bretylium for premature ventricular contractions.

72-year-old male. Past history of cerebrovascular accident. This man developed hypotension and no urinary output immediately after admission. Respiratory failure required intubation but was shortly followed by a flat line EKG.

Discussion

How do these results compare with those in larger hospitals with more fully equipped CCUs and more highly trained staff?

Our overall in-hospital death rate was 18.8% compared with 21.7% at one of the larger Duluth hospitals and an estimate of 16-22% at the other² over a similar time period.

Zmyslinski et al. describe a 22% mortality during 1978 in their Columbia, South Carolina hospital among 460 patients admitted with the primary diagnosis of acute myocardial infarction.³

Latting, et al, reported 32% in hospital mortality for myocardial infarction patients over the age of 70. Our figure would be 36.6%, but we had no deaths in patients under 70 years old.⁴

In a study of 224 patients treated for acute myocardial infarction in Concord, Massachusetts, there was an 18% in hospital mortality, very similar to our experience.⁵

In a multicenter review of 50,000 myocardial infarction cases from 1973, Shortell & Lo Gerfo divided cases into groups based on age, over or under 65 years and by admission systolic blood pressures. They observed an 82% mortality in patients 65 or over whose admission systolic blood pressure was less than 90 and a 33% mortality among patients 65 or over with admission systolic blood pressures over 100.⁶

Stross, et. al. compared mortality between small hospital CCUs and larger hospital CCUs in Michigan from 1969-74. They described a crude mortality rate of 14.5% in the smaller hospitals compared with 11.5% in the larger institutions. They felt this difference not to be statistically significant. However, they omitted from their mortality figures critically ill patients who died within 24 hours of admission and for whom complete histories were not available. This may account for their low mortality figures.⁷

Some authors^{6,7} have presented evidence that hospitals caring for fewer than 60 acute myocardial infarction patients per year have higher mortality

figures than institutions with a heavier cardiac case load. Although our volume is far fewer than 60 cases per year, our experience does not seem to reflect this higher mortality. That may in part be due to physician and nurse training or experience levels, standing orders and protocols for myocardial infarction patients, and the fact that not all low volume hospitals are equivalent in the quality of cardiac care offered.

In brief, the total mortality from acute myocardial infarction treated at our very small hospital seems similar to the experience of large institutions. Only two of 32 patients required transfer to a larger CCU; this was readily accomplished; and these patients survived.

Of the six in hospital deaths, five were due to pump failure and cardiogenic shock and one was related to a rhythm disturbance. The average age of these patients was 77 with two men and four women. It is unlikely, that the outcomes would have been significantly altered by a more fully equipped CCU and specialized care.

The man and woman with cardiac deaths shortly after discharge both had suffered myocardial infarctions complicated by congestive heart failure. They were treated before the general use of β blockers post myocardial infarction.

Our patients were able to be cared for close to home, allowing their relatives and friends to visit readily. In general they were treated by physicians who knew them previously and had ready access to all previous medical records. Nursing and ancillary personnel were often friends or neighbors.

Are these patients treated as efficiently and cost effectively in a very small hospital as in a larger institution? The lengths of stay were very slightly below the observed averages for our region. A detailed breakdown of total hospital charges and physician charges are presented in the Table. The average total hospital bill was \$2,249.72 and the average professional fee for all physician services was \$241.45.

Three recent cases of acute myocardial infarction cared for in a larger Duluth hospital averaged \$5,226 for hospital charges only. A Professional Standards Review Organization private review of myocardial infarction cases cared for in the Minneapolis area calculated an average hospital bill of \$4,303 for a 9.2 day hospital stay.⁸

PSRO data for myocardial infarction in the entire

state of Minnesota during the year July, 1979 through June, 1980, revealed an average length of stay of 11.5 days, very similar to our experience, but an average bill of \$3,715.30.⁹

These figures range from 65% to 130% higher than our hospital costs.

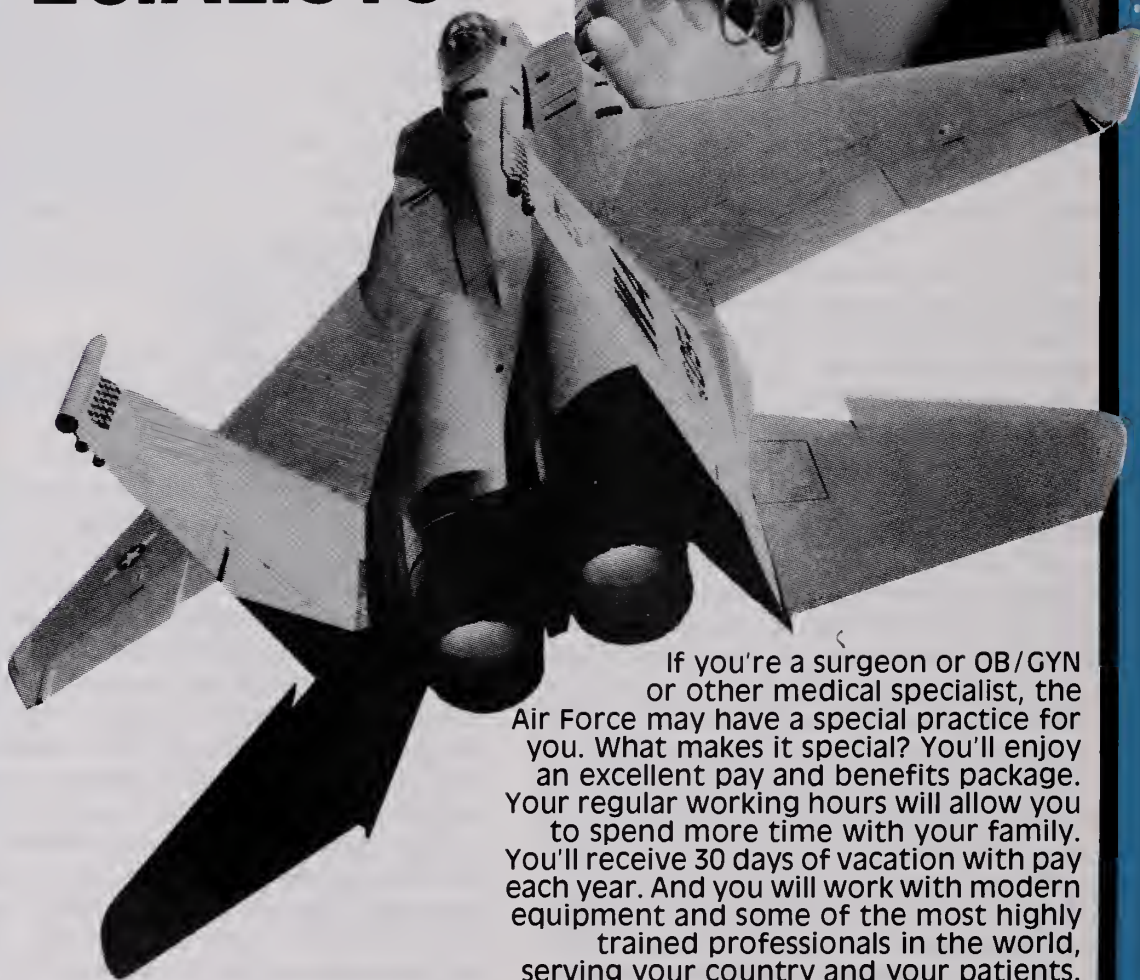
Total physician fees are more difficult to assess. However, inquiries at two Duluth internal medicine offices indicated a base charge of \$290 for eleven days of hospital care in cases of acute myocardial infarction. Fees for care by a cardiologist, extra visits, and consultations with other physicians could all be expected to raise the total physician fees.

In summary, it would seem that a rural or small town hospital should be able to care both competently and very cost effectively for its myocardial infarction patients. It would be interesting to see further studies to help define which patients might be benefited by transfer to a more sophisticated CCUs, as well as studies to examine the benefits and savings of caring for the vast majority of rural or small town myocardial infarction victims in local hospitals.

Summary

A retrospective study was undertaken covering all patients cared for with the diagnosis of myocardial infarction over an eighteen month period in a thirty bed small town hospital. There were a total of thirty-two patients, and the total in-hospital mortality was 18.8%, with five patients dying in cardiogenic shock and one dying from arrhythmia. 40.6% of the cases were totally uncomplicated medically; of the cases showing complications, most frequent were severe congestive heart failure or cardiogenic shock, recurrent or continuing infarct, and recurrent episodes of chest pain not related to extension of the infarct. The mean age of all the patients included in the review was 71.9 years, the mean age of the cases resulting in death was 76.8 years. Two patients required transfer to a coronary care unit in another hospital setting, and both of these patients survived. The average length of stay was 11 days. The mean hospital bill including all hospital, laboratory, therapy and medication charges was \$2,249.72; the mean physician professional fees in total averaged \$241.45. It seems feasible from both a medical and an economic point of view to care for the majority of rural or small town patients with myocardial infarctions in their own local hospitals.

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Rheumatoid Arthritis and the Kidney

PETER A. SCHLESINGER, M.D.*

OUR UNDERSTANDING of renal disease in patients with rheumatoid arthritis (RA) has evolved over the past two decades, as we have gained new insights into mechanisms of renal injury and new analytical tools such as electron and immunofluorescence microscopy. Early reports claimed a high incidence not only of chronic renal disease, but also of death secondary to uremia. Current experience suggests that while life-threatening renal disease is relatively rare, various abnormalities, sometimes subtle, are frequently present.

Drug therapy is a major cause of renal disease in RA. Salicylates and all of the non-steroidal anti-inflammatory drugs (NSAIDs) have been associated with "functional" renal insufficiency¹. This condition (to be discussed in detail in a future Rheumatology Corner) is related to renal prostaglandin inhibition and is characterized by a reversible decrease in renal blood flow and sodium excretion, with a resultant increase in body weight, BUN, and creatinine. More seriously, analgesic nephropathy, with chronic tubulo-interstitial disease, renal papillary necrosis, and an increased risk of urothelial malignancy, is correlated with prolonged regular use of phenacetin and acetaminophen. Either of these two drugs, in combination with NSAIDs, has greater potential toxicity owing to reduced renal blood flow induced by the latter².

Two remittive agents in RA, gold salts and D-penicillamine, are capable of inducing transient proteinuria and microscopic hematuria. Dose reductions will occasionally allow continued therapy. A full-blown nephrotic syndrome may develop, however, with either drug; for gold the incidence is up to 2.6%³. The lesion most often seen is a membranous glomerulonephritis (GN). Most patients recover completely; a few have persistent proteinuria without renal insufficiency.

Recently, the existence of renal lesions intrinsic to RA has been championed. Samuels et al., reviewing a group of patients with "idiopathic" membranous GN, found the diagnosis of RA to be over-represented compared to a control group⁴. Rao et al. performed

renal biopsies on 21 RA patients with clinical renal abnormalities; a majority had GN of various histologic types, usually with evidence of immune complex deposition and occasionally progressing to renal failure⁵. In neither series could drug therapy be implicated in the majority of cases. That immune complex GN can occur makes intuitive sense, since circulating immune complexes are often present in RA. It is conceivable that gold or D-penicillamine may render them more nephritogenic⁶. Finally, some investigators have noted a frequent finding of obliterative renal vascular lesions, in the absence of hypertension, which could conceivably be immunologically mediated.^{3,7}

Secondary amyloidosis, with renal involvement usually presenting as the nephrotic syndrome, occurs in about 5-7% of longstanding RA patients^{3,8}. Progressive renal insufficiency is the rule, although it develops at a variable rate. Treatment is supportive and directed at the underlying RA, although experimental approaches are being attempted. Rarer forms of renal involvement in RA include vasculitis, as part of a systemic necrotizing rheumatoid vasculitis. Sjogren's syndrome, when present, may lead to lymphocytic interstitial infiltration and tubular defects, especially renal tubular acidosis³.

When an abnormal urine sediment, proteinuria, or diminished renal function appears in a rheumatoid arthritic, careful review of the patient's drug intake is mandatory. If abnormalities persist despite removal of suspect drugs, urologic evaluation or renal biopsy is often indicated to clarify the etiology and to guide therapy.

TABLE

Renal Involvement in Rheumatoid Arthritis

Drugs

salicylates

non-steroidal anti-inflammatory drugs
(NSAIDs)

analgesics

gold salts

D-penicillamine

Primary glomerular disease

Systemic necrotizing vasculitis

Amyloidosis

Sjogren's syndrome

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Epilepsy and Oral Contraceptives

A Therapeutic Dilemma

MIGUEL E. FIOL, M.D.;* ILO E. LEPPIK, M.D.* and JOHN R. GATES, M.D.*

Proper use of oral contraceptives by a woman of child-bearing potential with seizures poses many problems. Oral contraceptives may exacerbate seizures; the effectiveness of oral contraceptives may be affected by antiepileptic drugs; and antiepileptic drug levels may be affected by contraceptives. This review of the available literature proposes practical guidelines for the management of this situation.

IN MINNESOTA, IT is estimated that there are 20,000-30,000 women of child bearing potential who have a seizure disorder. We have encountered women who have been denied oral contraceptives by clinics or physicians out of fear that the seizure disorder might be exacerbated. This prompted us to review the available literature and we identified three potential areas of adverse interactions. These are: effect of oral contraceptives on seizure threshold, alterations of antiepileptic drug levels by oral contraceptives, and change in oral contraceptive effectiveness caused by antiepileptic drugs.

Estrogen, Progesterone, Oral Contraceptives and Seizures

Estrogens may be epileptogenic. Several investigators have shown that administration of estrogen preparation to cats, monkeys and rats is associated with a lowering of the minimum electroshock seizure threshold. Estrogen applied directly to the cortex of animals results in focal activation of spikes. Human studies have shown that administration of estrogen intravenously to 16 women with epilepsy (Parmarin 20-40 mg) activated spikes in EEGs of 11¹. Indirect evidence for exacerbation of seizures by estrogen has come from studies of menstrual cycles. One evaluation of 50 epileptic inpatients demonstrated that fewer seizures occurred during the luteal phase (low estrogen) of the menstrual cycle². In a more recent study, seven women with partial and generalized seizures showed a significant increase in both types of seizures during the time when the estrogen/

progesterone ratio was high³.

Progesterone, on the other hand, does not alter seizure threshold or may actually reduce the number of seizures⁴.

There have only been a few studies of the effect of oral contraceptives on seizure frequency in patients with epilepsy. A double blind crossover study of 20 outpatients with partial and generalized seizures demonstrated that use of a low estrogen/progesterone (Norinyl-1) preparation for three months had no effect on the seizure frequency as compared with placebo⁵. Similar results were found in 11 patients with partial and generalized seizures treated with large doses of estrogen/progesterone preparation (5.0 mg Lynestrenol and 0.15 mg Mestranol) over three menstrual cycles⁶. Ovostion (VEB Jenapharm) given to 31 women with epilepsy over several menstrual periods failed to demonstrate an increase in seizures⁷. One report of six patients, however, related an exacerbation of seizures to treatment with oral contraceptives⁸. There are few reports of decrease seizures during the treatment with high progesterone containing preparations^{9,10}.

Epilepsy and Oral Contraceptive Failure

A potential problem of antiepileptic drug use with oral contraceptives is oral contraceptive failure. In one study, three "pill failures" were observed in 41 patients with seizures, an incidence three times higher than expected¹¹. Other studies have also demonstrated a higher rate of pregnancies attributable to loss of effectiveness of oral contraceptives¹²⁻¹⁴. The mechanism of this is most likely induction of hepatic microsomal enzymes by antiepileptic drugs, increasing the hydroxylation of estrogen and progesterone. Because of the failure rate, recommendations for using preparations containing at least 50 micrograms of estrogen have been made¹⁵.

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Supported in part by the Minnesota Comprehensive Epilepsy Program NIH Grant #1 P50 NS16308.

Oral Contraceptives and Antiepileptic Drug Levels

Oral contraceptives may lower phenytoin (Dilantin®) levels, as 40 women with epilepsy were noted to have a lower plasma phenytoin level than expected from drug dose. The lowering of phenytoin level was relatively small, however¹⁶. A controlled population of 125 women nonusers of oral contraceptives was used as a control group. During an evaluation of seven epileptic patients during six menstrual cycles, no definite correlation between changes in hormone concentrations and levels of phenytoin, phenobarbital or carbamazepine were noted.¹⁷ Thus, from limited data, a small decrease or no change may be expected.

Discussion

Considering the importance of the problem, there have been relatively few good clinical studies investigating the interactions of oral contraceptives with seizures and antiepileptic drugs. While estrogens have been shown to be epileptogenic in experimental animal models, only one study in which estrogen was

administered to women with seizures has been done¹. Indirect evidence from two studies involving 57 women suggest more seizures may occur during the menstrual cycle during which estrogen levels are high. Therefore, low estrogen containing preparations would appear to be most prudent for use in women with frequent seizures. There is some evidence suggesting that high progesterone containing preparations might diminish seizures. However, low estrogen preparations may be associated with a higher rate of "pill failure".

Although the number of studies is small, there may be a slight decrease in antiepileptic drug concentrations caused by the concomitant use of oral contraceptives.

From review of the existing limited literature, it appears that an increase in seizure frequency would not be precipitated by appropriate selection of oral contraceptives. Women of child-bearing potential should be cautioned about the possibility of a higher rate of "pill failure" and alternative means of birth control should be discussed. Antiepileptic drug levels should be monitored, especially if there is an increase in seizure frequency.

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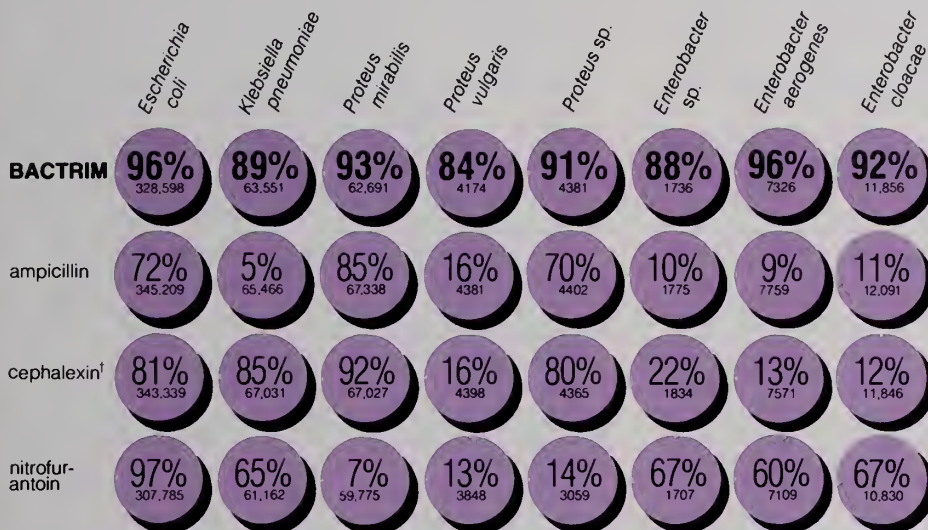
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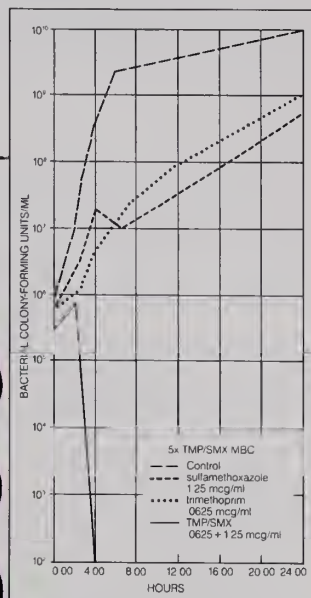
Percent of isolates of common uropathogens sensitive to BACTRIM and to other antimicrobials



†Analogous to cephalothin, the primary antibiotic disc used in testing.

Source: The Bacteriologic Report, BAC-DATA Medical Information Systems, Inc., Winter Series, 1981-82. Numbers under percentages refer to the projected number of isolates tested.

RAPID IN VITRO DESTRUCTION OF *E. COLI**



Kill curve kinetics of Bactrim and its individual components against *E. coli* in vitro.¹

The bactericidal action of Bactrim has been demonstrated *in vitro* on laboratory strains of *E. coli*^{1,2} and on clinical isolates of *E. coli*, *Klebsiella-Enterobacter*, *Proteus mirabilis* and *Morganella morganii*³—the most common causative organisms of urinary tract infections.⁴ More than 100 published studies attest to the efficacy of Bactrim in recurrent urinary tract infections due to these organisms.⁵ In comparative studies with other antimicrobials, Bactrim has consistently demonstrated unsurpassed efficacy during therapy.⁶⁻¹¹

Resistance to Bactrim develops more slowly than to either of its components alone *in vitro*.^{*} Among urinary tract isolates, resistance has rarely emerged in susceptible strains.^{5,12} Bactrim is contraindicated in pregnancy at term, during lactation, in infants less than two months old and in documented megaloblastic anemia due to folate deficiency. Initial episodes of uncomplicated urinary infections should be treated with a single-agent antimicrobial.

Bactrim™ DS

(trimethoprim and sulfamethoxazole/Roche)

b.i.d. for recurrent urinary tract infections

^{*}*In vitro* data do not necessarily predict clinical results.

References: 1. Data on file, Hoffmann-La Roche Inc., Nutley, NJ. 2. Kramer MJ, Mauriz YR, Robertson TL, Timmes MD. Morphological studies on the effect of subinhibitory and inhibitory doses of sulfamethoxazole-trimethoprim combination on *Escherichia coli*. Presented at the 12th International Congress of Chemotherapy, Florence, Italy, Jul 19-24, 1981. 3. Spicheckler J et al. *Rev Infect Dis* 4:562-565, Mar-Apr 1982. 4. Stamey TA. Pathogenesis and Treatment of Urinary Tract Infections. Baltimore, Williams & Wilkins, 1980, p. 13. 5. Ronald AF. *Clin Ther* 3:176-189, Mar 1980. 6. Cooper J, Brumitt W, Hamilton-Miller JMT. *J Antimicrob Chemother* 6:231-239, 1980. 7. Gower PE, Tasker PRW. *Br Med J* 1:684-686, Mar 20, 1976. 8. Cosgrove MD, Morrow JW. *J Urol* 111:670-672, May 1974. 9. Irvani A et al. *Antimicrob Agents Chemother* 19:598-604, Apr 1981. 10. Schaeffer AJ, Flynn S, Jones J. *J Urol* 125:825-827, Jun 1981. 11. Rous SN. *J Urol* 125:228-229, Feb 1981. 12. BAC-DATA Medical Information Systems, Inc., Bacteriologic Reports, Winter Series, 1976-82.

Bactrim® DS

(trimethoprim and sulfamethoxazole/Roche)

Before prescribing, please consult complete product information, a summary of which follows:

Indications and Usage: For the treatment of urinary tract infections due to susceptible strains of the following organisms: *Escherichia coli*, *Klebsiella-Enterobacter*, *Proteus mirabilis*, *Proteus vulgaris*, *Proteus morganii*. It is recommended that initial episodes of uncomplicated urinary tract infections be treated with a single effective antibacterial agent rather than the combination. Note: The increasing frequency of resistant organisms limits the usefulness of all antibacterials, especially in these urinary tract infections.

For acute otitis media in children due to susceptible strains of *Haemophilus influenzae* or *Streptococcus pneumoniae* when in physician's judgment it offers an advantage over other antimicrobials. To date, there are limited data on the safety of repeated use of Bactrim in children under two years of age. Bactrim is not indicated for prophylactic or prolonged administration in otitis media at any age.

For acute exacerbations of chronic bronchitis in adults due to susceptible strains of *Haemophilus influenzae* or *Streptococcus pneumoniae* when in physician's judgment it offers an advantage over a single antimicrobial agent. For enteritis due to susceptible strains of *Shigella flexneri* and *Shigella sonnei* when antibacterial therapy is indicated.

Also for the treatment of documented *Pneumocystis carinii* pneumonitis. Contraindications: Hypersensitivity to trimethoprim or sulfonamides; patients with documented megaloblastic anemia due to folate deficiency; pregnancy at term; nursing mothers because sulfonamides are excreted in human milk and may cause kernicterus; infants less than 2 months of age.

Warnings: BACTRIM SHOULD NOT BE USED TO TREAT STREPTOCOCCAL PHARYNGITIS. Clinical studies show that patients with group A β -hemolytic streptococcal tonsillopharyngitis have higher incidence of bacteriologic failure when treated with Bactrim than do those treated with penicillin. Deaths from hypersensitivity reactions, hepatocellular necrosis, agranulocytosis, aplastic anemia and other blood dyscrasias have been associated with sulfonamides. Experience with trimethoprim is much more limited but occasional interference with hemopoiesis has been reported as well as an increased incidence of thrombopenia with purpura in elderly patients on certain diuretics, primarily thiazides. Sore throat, fever, pallor, purpura or jaundice may be early signs of serious blood disorders. Frequent CBCs are recommended; therapy should be discontinued if a significantly reduced count of any formed blood element is noted.

Precautions: General: Use cautiously in patients with impaired renal or hepatic function, possible folate deficiency, severe allergy or bronchial asthma. In patients with glucose-6-phosphate dehydrogenase deficiency, hemolysis, frequently dose-related, may occur. During therapy, maintain adequate fluid intake and perform frequent urinalyses, with careful microscopic examination, and renal function tests, particularly where there is impaired renal function. Bactrim may prolong prothrombin time in those receiving warfarin; reassess coagulation time when administering Bactrim to these patients.

Pregnancy: Teratogenic Effects: Pregnancy Category C. Because trimethoprim and sulfamethoxazole may interfere with folate metabolism, use during pregnancy only if potential benefits justify the potential risk to the fetus.

Adverse Reactions: All major reactions to sulfonamides and trimethoprim are included, even if not reported with Bactrim. **Blood dyscrasias:** Agranulocytosis, aplastic anemia, megaloblastic anemia, thrombopenia, leukopenia, hemolytic anemia, purpura, hypoprothrombinemia and methemoglobinemia. **Allergic reactions:** Erythema multiforme, Stevens-Johnson syndrome, generalized skin eruptions, epidermal necrolysis, urticaria, serum sickness, pruritus, exfoliative dermatitis, anaphylactoid reactions, periorbital edema, conjunctival and scleral injection, photosensitization, arthralgia and allergic myocarditis. **Gastrointestinal reactions:** Glossitis, stomatitis, nausea, abdominal pain, hepatitis, hepatocellular necrosis, diarrhea, pseudomembranous colitis and pancreatitis. **CNS reactions:** Headache, peripheral neuritis, mental depression, convulsions, ataxia, hallucinations, tinnitus, vertigo, insomnia, apathy, fatigue, muscle weakness and nervousness. **Miscellaneous reactions:** Drug fever, chills, toxic nephrosis with oliguria and anuria, periarthritis nodosa and L.E. phenomenon. Due to certain chemical similarities to some glycosides, diuretics (acetazolamide, thiazides) and oral hypoglycemic agents, sulfonamides have caused rare instances of goiter production, diuresis and hypoglycemia in patients; cross-sensitivity with these agents may exist. In rats, long-term therapy with sulfonamides has produced thyroid malignancies.

Dosage: Not recommended for infants less than two months of age. URINARY TRACT INFECTIONS AND SHIGELLOSIS IN ADULTS AND CHILDREN, AND ACUTE OTITIS MEDIA IN CHILDREN.

Adults: Usual adult dosage for urinary tract infections—1 DS tablet (double strength), 2 tablets (single strength) or 4 teasp. (20 ml) b.i.d. for 10-14 days. Use identical daily dosage for 5 days for shigellosis.

Children: Recommended dosage for children with urinary tract infections or acute otitis media—8 mg/kg trimethoprim and 40 mg/kg sulfamethoxazole per 24 hours, in two divided doses for 10 days. Use identical daily dosage for 5 days for shigellosis.

For patients with renal impairment: Use recommended dosage regimen when creatinine clearance is above 30 ml/min. If creatinine clearance is between 15 and 30 ml/min, use one-half the usual regimen. Bactrim is not recommended if creatinine clearance is below 15 ml/min.

ACUTE EXACERBATIONS OF CHRONIC BRONCHITIS IN ADULTS:

Usual adult dosage: 1 DS tablet (double strength), 2 tablets (single strength) or 4 teasp. (20 ml) b.i.d. for 14 days.

PNEUMOCYSTIS CARINII PNEUMONITIS:

Recommended dosage: 20 mg/kg trimethoprim and 100 mg/kg sulfamethoxazole per 24 hours in equal doses every 6 hours for 14 days. See complete product information for suggested children's dosage table.

Supplied: Double Strength (DS) tablets, each containing 160 mg trimethoprim and 800 mg sulfamethoxazole, bottles of 100 and 500; Tel-E-Dose® packages of 100; Prescription Paks of 20, tablets, each containing 80 mg trimethoprim and 400 mg sulfamethoxazole—bottles of 100 and 500; Tel-E-Dose® packages of 100, Prescription Paks of 40. Pediatric Suspension, containing 40 mg trimethoprim and 200 mg sulfamethoxazole per teaspoonful (5 ml), cherry flavored—bottles of 100 ml and 16 oz (1 pint). Suspension, containing 40 mg trimethoprim and 200 mg sulfamethoxazole per tea spoonful (5 ml); fruit-licorice flavored—bottles of 16 oz (1 pint).

References:

- Stone PH, Tur ZG, Muller JE. Efficacy of nifedipine therapy for refractory angina pectoris. *Am Heart J* 104 672-681, September 1982
- Antman E, Muller J, Goldberg S, et al. Nifedipine therapy for coronary artery spasm: Experience in 127 patients. *N Engl J Med* 302 1269-1273, June 5, 1980.

BRIEF SUMMARY

PROCARDIA® (nifedipine) CAPSULES

For Oral Use

INDICATIONS AND USAGE: I. **Vasospastic Angina:** PROCARDIA (nifedipine) is indicated for the management of vasospastic angina confirmed by any of the following criteria: 1) classical pattern of angina at rest accompanied by ST segment elevation, 2) angina or coronary artery spasm provoked by ergonovine, or 3) angiographically demonstrated coronary artery spasm. In those patients who have had angiography, the presence of significant fixed obstructive disease is not incompatible with the diagnosis of vasospastic angina, provided that the above criteria are satisfied. PROCARDIA may also be used where the clinical presentation suggests a possible vasospastic component but where vasospasm has not been confirmed, e.g., where pain has a variable threshold on exertion or in unstable angina where electrocardiographic findings are compatible with intermittent vasospasm, or when angina is refractory to nitrates and/or adequate doses of beta blockers.

II. **Chronic Stable Angina (Classical Effort-Associated Angina):** PROCARDIA is indicated for the management of chronic stable angina (effort-associated angina) without evidence of vasospasm in patients who remain symptomatic despite adequate doses of beta blockers and/or organic nitrates or who cannot tolerate those agents.

In chronic stable angina (effort-associated angina) PROCARDIA has been effective in controlled trials of up to eight weeks duration in reducing angina frequency and increasing exercise tolerance, but confirmation of sustained effectiveness and evaluation of long-term safety in those patients are incomplete.

Controlled studies in small numbers of patients suggest concomitant use of PROCARDIA and beta blocking agents may be beneficial in patients with chronic stable angina, but available information is not sufficient to predict with confidence the effects of concurrent treatment, especially in patients with compromised left ventricular function or cardiac conduction abnormalities. When introducing such concomitant therapy, care must be taken to monitor blood pressure closely since severe hypotension can occur from the combined effects of the drugs. (See Warnings.)

CONTRAINDICATIONS: Known hypersensitivity reaction to PROCARDIA.

WARNINGS: Excessive Hypotension: Although in most patients, the hypotensive effect of PROCARDIA is modest and well tolerated, occasional patients have had excessive and poorly tolerated hypotension. These responses have usually occurred during initial titration or at the time of subsequent upward dosage adjustment, and may be more likely in patients on concomitant beta blockers.

Severe hypotension and/or increased fluid volume requirements have been reported in patients receiving PROCARDIA together with a beta blocking agent who underwent coronary artery bypass surgery using high dose fentanyl anesthesia. The interaction with high dose fentanyl appears to be due to the combination of PROCARDIA and a beta blocker, but the possibility that it may occur with PROCARDIA alone, with low doses of fentanyl, in other surgical procedures, or with other narcotic analgesics cannot be ruled out. In PROCARDIA treated patients where surgery using high dose fentanyl anesthesia is contemplated, the physician should be aware of these potential problems and, if the patient's condition permits, sufficient time (at least 36 hours) should be allowed for PROCARDIA to be washed out of the body prior to surgery.

Increased Angina: Occasional patients have developed well documented increased frequency, duration or severity of angina on starting PROCARDIA or at the time of dosage increases. The mechanism of this response is not established but could result from decreased coronary perfusion associated with decreased diastolic pressure with increased heart rate, or from increased demand resulting from increased heart rate alone.

Beta Blocker Withdrawal: Patients recently withdrawn from beta blockers may develop a withdrawal syndrome with increased angina, probably related to increased sensitivity to catecholamines. Initiation of PROCARDIA treatment will not prevent this occurrence and might be expected to exacerbate it by provoking reflex catecholamine release. There have been occasional reports of increased angina in a setting of beta blocker withdrawal and PROCARDIA initiation. It is important to taper beta blockers if possible, rather than stopping them abruptly before beginning PROCARDIA.

Congestive Heart Failure: Rarely, patients, usually receiving a beta blocker, have developed heart failure after beginning PROCARDIA. Patients with tight aortic stenosis may be at greater risk for such an event.

PRECAUTIONS: General: Hypotension: Because PROCARDIA decreases peripheral vascular resistance, careful monitoring of blood pressure during the initial administration and titration of PROCARDIA is suggested. Close observation is especially recommended for patients already taking medications that are known to lower blood pressure. (See Warnings.)

Peripheral edema: Mild to moderate peripheral edema, typically associated with arterial vasodilation and not due to left ventricular dysfunction, occurs in about one in ten patients treated with PROCARDIA. This edema occurs primarily in the lower extremities and usually responds to diuretic therapy. With patients whose angina is complicated by congestive heart failure, care should be taken to differentiate this peripheral edema from the effects of increasing left ventricular dysfunction.

Drug interactions: Beta-adrenergic blocking agents. (See Indications and Warnings.) Experience in over 1400 patients in a non-comparative clinical trial has shown that concomitant administration of PROCARDIA and beta-blocking agents is usually well tolerated, but there have been occasional literature reports suggesting that the combination may increase the likelihood of congestive heart failure, severe hypotension or exacerbation of angina.

Long-acting nitrates. PROCARDIA may be safely co-administered with nitrates, but there have been no controlled studies to evaluate the antianalgesic effectiveness of this combination.

Digoxin. Administration of PROCARDIA with digoxin increased digoxin levels in nine of twelve normal volunteers. The average increase was 45%. Another investigator found no increase in digoxin levels in thirteen patients with coronary artery disease. In an uncontrolled study of over two hundred patients with congestive heart failure during which digoxin blood levels were not measured, digoxin toxicity was not observed. Since there have been isolated reports of patients with elevated digoxin levels, it is recommended that digoxin levels be monitored when initiating adjusting, and discontinuing PROCARDIA to avoid possible over- or under-digitalization.

Carotidogenesis, mutagenesis, impairment of fertility. When given to rats prior to mating, nifedipine caused reduced fertility at a dose approximately 30 times the maximum recommended human dose.

Pregnancy: Category C. Please see full prescribing information with reference to teratogenicity in rats, embryotoxicity in rats, mice and rabbits, and abnormalities in monkeys.

ADVERSE REACTIONS: The most common adverse events include dizziness or light-headedness, peripheral edema, nausea, weakness, headache and flushing each occurring in about 10% of patients, transient hypotension in about 5%, palpitation in about 2% and syncope in about 0.5%. Syncopal episodes did not recur with reduction in the dose of PROCARDIA or concomitant antianalgesic medication. Additionally, the following have been reported: muscle cramps, nervousness, dyspnea, nasal and chest congestion, diarrhea, constipation, inflammation, joint stiffness, shakiness, sleep disturbances, blurred vision, difficulties in balance, dermatitis, pruritus, urticaria, fever, sweating, chills, and sexual difficulties. Very rarely, introduction of PROCARDIA therapy was associated with an increase in anginal pain, possibly due to associated hypotension.

In addition, more serious adverse events were observed, not readily distinguishable from the natural history of the disease in these patients. It remains possible, however, that some or many of these events were drug related. Myocardial infarction occurred in about 4% of patients and congestive heart failure or pulmonary edema in about 2%. Ventricular arrhythmias or conduction disturbances each occurred in less than 0.5% of patients.

Laboratory Tests: Rare, mild to moderate, transient elevations of enzymes such as alkaline phosphatase, CPK, LDH, SGOT, and SGPT have been noted, and a single incident of significantly elevated transaminases and alkaline phosphatase was seen in a patient with a history of gall bladder disease after about eleven months of nifedipine therapy. The relationship to PROCARDIA therapy is uncertain. These laboratory abnormalities have rarely been associated with clinical symptoms. Cholestasis, possibly due to PROCARDIA therapy, has been reported twice in the extensive world literature.

HOW SUPPLIED: Each orange, soft gelatin PROCARDIA CAPSULE contains 10 mg of nifedipine. PROCARDIA CAPSULES are supplied in bottles of 100 (NDC 0069-2600-66), 300 (NDC 0069-2600-72), and unit dose (10x10) (NDC 0069-2600-41). The capsules should be protected from light and moisture and stored at controlled room temperature 59° to 77°F (15° to 25°C) in the manufacturer's original container.

More detailed professional information available on request

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"I can do things that I couldn't do for 3 yrs. including joining the human race again."



*"My daily routine consisted of
sitting in my chair trying to stay alive."*

*"My doctor switched me to
PROCARDIA^[*] as soon as it became
available. The change in my condition
is remarkable."*

*"I shop, cook and can plant
flowers again."*

*"I have been able to do volunteer
work...and feel needed and useful
once again."*

PROCARDIA can mean the return to a more normal life for your patients—having fewer anginal attacks,¹ taking fewer nitroglycerin tablets,² doing more, and being more productive once again.

Side effects are usually mild (most frequently reported are dizziness or lightheadedness, peripheral edema, nausea, weakness, headache and flushing, each occurring in about 10% of patients, transient hypotension in about 5%, palpitation in about 2% and syncope in about 0.5%).



for the varied faces of angina

PROCARDIA[®] **(NIFEDIPINE)** Capsules 10 mg

* Procordia is indicated for the management of:

- 1) Confirmed vasospastic angina.
- 2) Angina where the clinical presentation suggests a possible vasospastic component.
- 3) Chronic stable angina without evidence of vasospasm in patients who remain symptomatic despite adequate doses of beta blockers and/or nitrates or who cannot tolerate these agents. In chronic stable angina (effort-associated angina) PROCARDIA has been effective in controlled trials of up to eight weeks' duration in reducing angina frequency and increasing exercise tolerance, but confirmation of sustained effectiveness and evaluation of long-term safety in these patients are incomplete.

Please see PROCARDIA brief summary on adjoining page.

Motrin[®]

ibuprofen, Upjohn

600 mg Tablets



More convenient for your patients

Upjohn

Dermatology

Cicatricial Pemphigoid

A rare but important bullous skin disease with mucosal involvement.

RANDALL ROENIGK, M.D.;* J. CORWIN VANCE, M.D.†

Cicatricial pemphigoid is an autoimmune bullous skin disease which characteristically involves the ocular and oral mucosa and occasionally the skin. It is an important disease to recognize since if untreated, the ocular lesions produce scarring and ultimately blindness. We report a case which presented with a dramatic bullous skin eruption, which underscores its position in the continuum of autoimmune bullous diseases. Therapy with prednisone and dapsone is discussed.

CICATRICIAL PEMPHIGOID (C.P.) is a rare disease, but one which is very important for practitioners to recognize since if untreated blindness may result. An earlier term, benign mucous membrane pemphigoid, is now generally felt to be inappropriate. A disease which may result in blindness can hardly be considered benign and while the most serious manifestations involve mucous membranes, it is by no means limited to them, as demonstrated by our patient who presented with a dramatic skin eruption.

Characteristically, C.P. presents with inflammation and erosions of mucosal surfaces, primarily oral.¹⁻³ The initial diagnosis may be desquamative gingivitis, but ocular, nasal, genital, GI, and respiratory tract lesions are common. Adhesions develop between the bulbar and lid conjunctivae, termed symblepharon, and if untreated results in blindness. Similarly, laryngeal involvement can progress to upper airway obstruction.

The primary skin lesions are tense blisters containing a clear fluid. In the Brunsting-Perry type of C.P. (B.P.P.) the blisters are grouped and tend to be limited to the head and neck leaving atrophic scars.⁴ This variant of C.P. as well as cases with concomitant bullous pemphigoid (B.P.) suggest that these diseases represent a continuum of autoimmune bullous diseases.⁵ Nevertheless, differentiation is important because of differing clinical courses.

Cutaneous involvement in C.P. occurs in about one fourth of cases.¹⁻³ Conversely, mucosal involvement occurs in approximately 30% of B.P.^{1,2} and in approximately 15% of cases of B.P.P.⁴

Differentiation from the other bullous skin diseases, such as pemphigus vulgaris which commonly involves mucosal surfaces¹⁻² may be difficult clinically. The Table gives five common autoimmune

bullous diseases, reviewing the differentiating features. Correct identification requires a combination of clinical features, pathological findings, immunofluorescence results, and often the electron microscopic picture.

Case Report

An 89-year-old white female came to the dermatology clinic at Hennepin County Medical Center (HCMC) on January 6, 1983 complaining of large blisters on her abdomen below her colostomy site, of two to three weeks duration. They were intensely

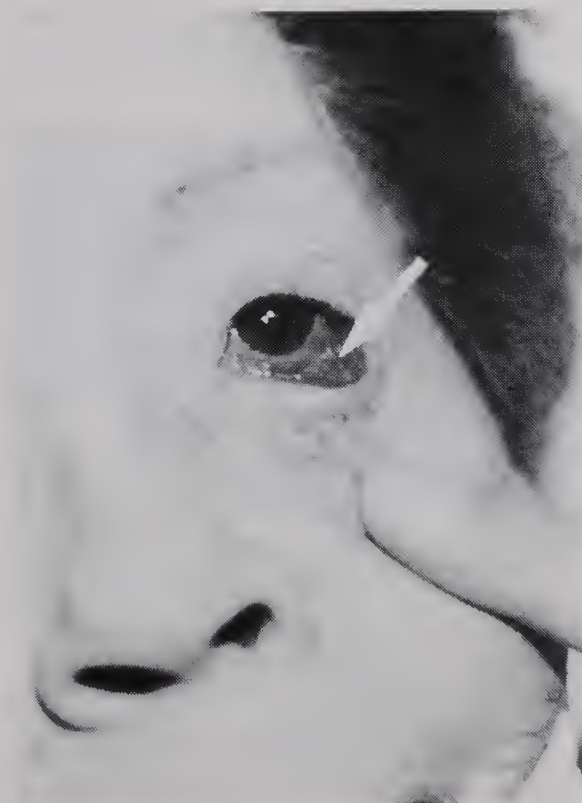


Fig. 1 — Our patient at first presentation. Note symblepharon (arrow) and lack of skin lesions. (Patient permission to reproduce).

*Resident, Department of Dermatology, University of Minnesota, Minneapolis

†Assistant Professor, Department of Dermatology, University of Minnesota and Assistant Chief, Department of Dermatology, Hennepin County Medical Center, Minneapolis.

pruritic, and extending their distribution. Her past medical history was significant in that she had had an adenocarcinoma of the colon (Dukes class B) treated in 1972 by colectomy. She in addition had hypertension, a sensorineural hearing loss, and vitamin B₁₂ deficiency.

On her initial physical examination she was found to have a patch of skin, measuring 10 x 12 centimeters, on her lower abdomen which was inflamed and contained several large tense bullae with clear fluid as well as areas of epithelial erosion. No oral blisters were found, but an intense conjunctivitis was present bilaterally (Figure 1).

The initial differential diagnosis included irritant or allergic contact dermatitis (colostomy adhesive), bullous pemphigoid, pemphigus vulgaris, bullous impetigo, erythema multiforme, bullous drug eruption, or herpes simplex. In order to make the correct diagnosis viral and bacterial cultures were obtained. A biopsy of a blister was taken for histopathological study; a biopsy of perilesional skin was taken for direct immunofluorescence; and serum was obtained for indirect immunofluorescence. Consultation by ophthalmology revealed the presence of marked conjunctivitis as well as symblepharon formation (Figure 1) which suggested the diagnosis of cicatricial pemphigoid. An otolaryngology consultation revealed the presence of oral and laryngeal erosions and ulcer-



Fig. 2 — Two weeks after Figure 1. Note extensive skin erosion and conjunctivitis. (Patient permission to reproduce).

ations that extended to the vocal cords. A biopsy of a tonsillar lesion was obtained.

Course

During the first week, her skin lesions rapidly progressed, with bullae forming on her right breast, face,

TABLE

Characteristics of some Autoimmune Blistering Diseases of the Skin

	Cicatricial Pemphigoid	Brunsting-Perry type	Bullous Pemphigoid	Bullous Dermatitis of Childhood	Pemphigus Vulgaris
Course	Chronic with little tendency to remission	chronic	Up to 6 years, self-limited with periods of remission	Spontaneous remission within remissions. Cessation by adulthood.	Rapid onset. Life threatening without treatment.
Age	6th-7th decade	6th-7th decade	6th-7th decade	1st-2nd decade	4th-5th decade
Skin lesion	Approximately 25% with tense bullae	Patches of tense bullae of head and neck that scar.	100% tense bullae	100% tense bullae	100% flaccid blisters or denuded skin.
Mucosal lesions	90% oral; 60% ocular; also pharynx, nose, larynx, genitalia, anus.	Rare	8-33% oral lesions reported.	Rare	Common
Characteristic histopathology	Subepidermal bullae with a mononuclear infiltrate.	Same as CP although more eosinophils may be present.	Subepidermal bullae with predominance of eosinophils.	Subepidermal bullae similar to BP.	Intraepidermal bullae with acantholysis and later eosinophilic spongiosis.
Electron microscopy	Fragmentation of basal lamina and loss of anchoring fibrils.	Similar to CP.	Separation of lamina lucida, rupture of anchoring filaments.	Similar to BP.	Dissolving of intercellular cement, destruction of desmosomes and tonofilaments.
Direct immunofluorescence	Linear BMZ; IgG and C3. Rarely IgA, IgM.	Linear BMZ; IgG and C3.	Linear BMZ; IgG, C3. IgA, IgM 25% of cases. Complement: C18 and C4 C3 and C5, properdin and factor B.	Linear BMZ; IgA, C3.	Intercellular pattern IgG, C3.
Indirect immunofluorescence	Rarely low titers anti-BMZ, IgG, IgA	One case anti-BMZ.	70-80% anti-BMZ, IgG.		Intercellular antibodies positive 50%.

neck, lower back, and legs (Figure 2). She was placed on prednisone 40 mg and dapsone 100mg daily, but then required hospitalization for a partial bowel obstruction that resolved in 24 hours. Her skin disease was continuing to worsen, and she was transferred to the dermatology service for intensive topical therapy with Burows solution compresses and topical 0.1% triamcinolone cream. There was satisfactory improvement after about one week, and the patient was discharged to be followed in the clinic. She continued to clear, and the prednisone was tapered over the following two months. She will be maintained on dapsone. Laboratory values were normal including G6PD.

Pathologic Findings

The skin biopsy of one of the smaller blisters revealed a subepidermal bulla. In the dermal inflammatory infiltrate there was a predominance of eosinophils (Figure 3). The tonsillar biopsy showed a submucosal separation of a similar nature. The biopsy for direct immunofluorescence demonstrated linear fluorescence at the dermal-epidermal junction revealing the presence of the following antigens: (Figure 4)

IgG	(4+)
IgA	(4+)
IgM	(1+)
Beta ₂ globulin	(2-3+)

Antibasement membrane zone antibody was detected in the serum by indirect immunofluorescence at a titer of 1:20 (Figure 5).

Discussion

Our case of cicatricial pemphigoid is unusual only in the extent and rapidity of progression of the skin lesions. Her skin biopsy served to place her diagnosis in the category of subepidermal blistering diseases and the immunofluorescence narrowed the differential diagnosis to the autoimmune bullous diseases having deposition of immunoglobulins at the dermal-epidermal junction (Table). The final diagnosis, however, depended on the clinical picture, and especially the presence of the symblepharon. The lesions were present on the abdomen and back as well as face and neck. Therefore this fits the diagnosis of C.P.¹⁻³ and not the BPP type.⁴

Skin biopsies for light microscopic study should be taken from early vesicles or perilesional skin. They reveal subepidermal bullae formation (Figure 3). The epidermal keratinocytes are mainly undisturbed. In the upper dermis there is a patchy perivascular infiltrate which may or may not contain eosinophils. Differentiation from bullous pemphigoid may be impossible, although BP usually has a higher proportion

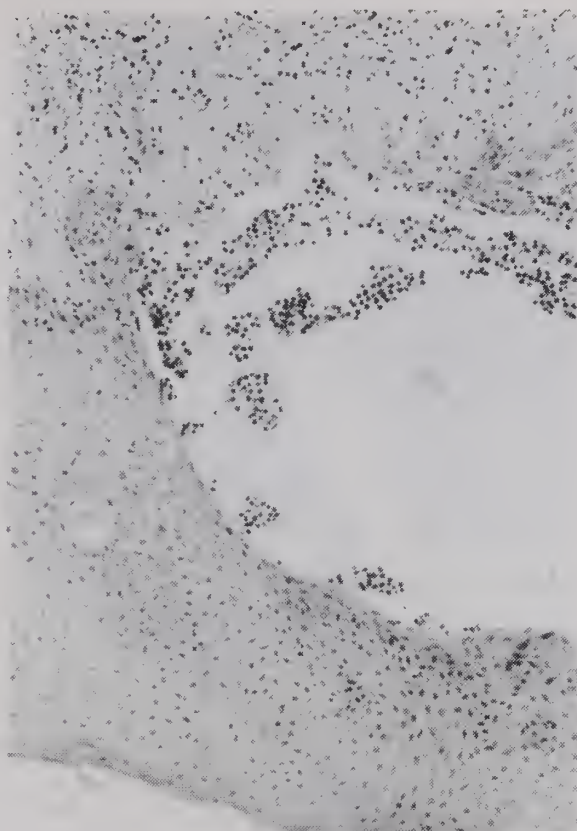


Fig. 3 — Hematoxylin and eosin stain of an intact blister. The bulla is subepidermal with little damage to the overlying epidermis. There is mononuclear dermal infiltrate with eosinophils as well as infiltrate in the bulla. (Courtesy of J. Goldes, M.D.)

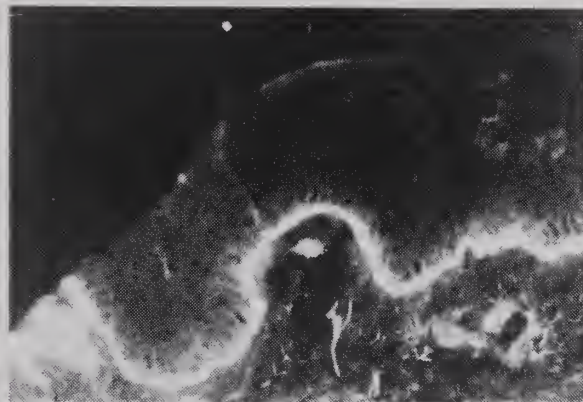


Fig. 4 — Direct immunofluorescence of skin that is positive at the dermal-epidermal junction in a continuous band for IgG, IgA, IgM, B₂C in our patient. (Courtesy of J. Goldes, M.D.)

of eosinophils in the dermal infiltrate than C.P.⁶

Biopsies for electron microscopy should also be taken from perilesional skin. The most conspicuous changes are in the upper dermis with basal lamina fragmentation, loss of anchoring fibrils, and dermal edema. Epidermal cells are spared. This selective damage to the basal lamina in clinically normal appearing skin may be characteristic of CP.^{7,8}

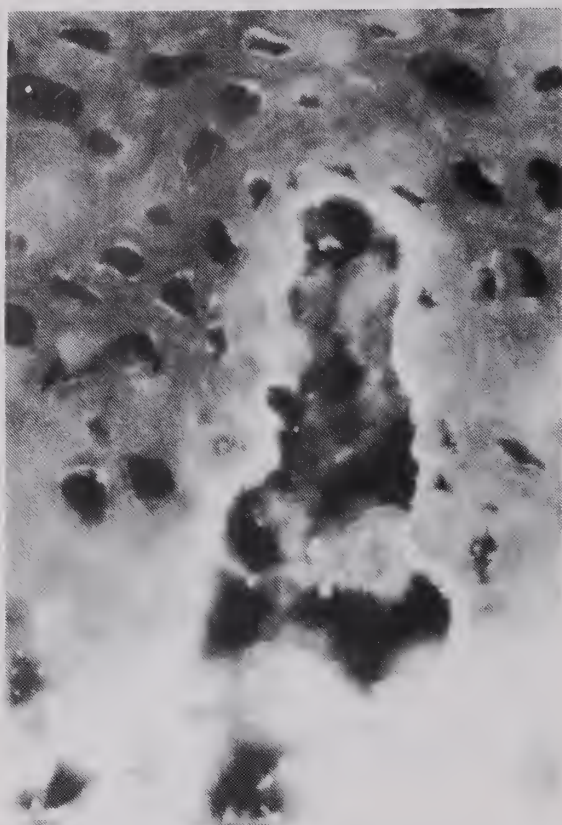


Fig. 5 — Indirect immunofluorescence with the patient's serum and monkey esophagus was positive at a titer of 1:20 for anti-BMZ antibody. Note fluorescence at the basement membrane.

Immunofluorescent studies are necessary for the diagnosis of CP.⁹⁻¹² Griffith, Fukuyawa, et al.¹² studied eleven cases and reviewed 60 others. Seven of their eleven cases had *in vivo* deposition of either immunoglobulins or complement at the basement membrane zone (BMZ) as demonstrated by direct immunofluorescence of skin biopsies. Seven of eleven were positive for IgG and C3, and four of the 11 for IgA and IgM. The typical pattern of fluorescence was a continuous band along the BMZ. They found no clear correlation between severity of disease and direct immunofluorescence findings. Sera studied by indirect immunofluorescence were all negative; but, in their review of the literature seven of sixty cases were positive. Our patient was positive for circulating anti-BMZ antibody, at a titer of 1:20, and had deposition of IgG, IgA, IgM and Beta₂ C globulin at the BMZ by direct immunofluorescence.

Malignant disease has been associated with BP in the past,¹³ but in his review of internal disorders and bullous skin disease, Callen concluded that no relationship exists.¹⁴ CP has never been specifically associated with malignant disease. Callen felt that the common denominator was old age. Neither BP nor

CP should be considered a cutaneous marker of malignancy. The colon adenocarcinoma in our patient had been present for over 10 years and there was no evidence for recurrence.

Other diseases have been associated with CP and BP,¹⁴ particularly other autoimmune diseases such as rheumatoid arthritis (RA). Callen reviewed 15 cases of RA having its onset after an episode of BP. Savin reviewed 49 cases of BP in which 11 were found to have RA with high titers of rheumatoid factor.¹⁵ Diabetes mellitus (DM) has also been found in association with BP. Downham reported DM in 14 of 34 patients with BP,¹⁶ the diagnosis of DM having been made prior to the onset of BP. This is of particular importance because therapy for both BP and CP commonly includes prednisone, which may precipitate DM.

Therapy of CP should initially be directed at the prevention of mucosal scarring. Although rare, laryngeal and esophageal obstructions are complications that require emergent care. Tracheostomies and gastrostomies have been necessary in some reports, but these can be avoided by proper therapy, including high dose steroids given acutely.¹ In the usual case, however, there is slowly progressive scarring resulting in loss of vision or upper airway obstruction, and therefore suppression of the disease on a chronic basis is necessary.

Systemic steroids in moderate doses (40-80mg of prednisone) is the best initial therapy,² but given the chronic persistent nature of the disease, combination therapy is usually used.¹ Methotrexate, nitrogen mustard, a antilymphocytic globulin have all been tried. Good results have been obtained using Azathioprine, Cyclophosphamide, or Sulfapyridine.^{17,18} Combination therapy with prednisone and azathioprine, cyclophosphamide or sulfapyridine have all been reported.

We started our patient on the combination of dapsone with prednisone. Rodgers et al.¹⁹ treated 24 patients with dapsone alone and 20 (83%) had partial or complete control of their disease. Control was achieved within four weeks in 11 of the 20 responders. The major concern while using dapsone is hemolytic anemia, particularly in patients with glucose-6-phosphate dehydrogenase or glutathione reductase deficiency. In their study, two patients had severe hemolysis and another five patients had a drop in hemoglobin of 2gm/dl or more. The mechanism of action of dapsone is unclear. Rodgers reviewed a few possible mechanisms:¹⁹ (1) Suppression of the Arthus reaction as has been demonstrated in the guinea pig. (2) Dapsone may have an antiinflammatory effect

comparable to other non-steroidal antiinflammatory agents such as indomethacin. (3) Inhibition of lysosomal enzyme release has been shown in the cartilage of rabbit ear, as with corticosteroids. (4) Dapsone interferes with the myeloperoxidase- H_2O_2 -halide-mediated cytotoxic system of the polymorphonuclear leukocyte. (5) Finally, dapsone may modulate the alternative complement pathway.

CP is a rare disease, but BP is not. Differentiation is important because of the significance of the mucosal lesions. Prompt institution of proper therapy is critical. Our patient responded well to combination therapy using prednisone and dapsone. The prednisone was discontinued after 10 weeks and maintenance therapy with dapsone has been continued but will be tapered over a period of months.

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Vacancy

State Board of Medical Examiners

A vacancy will occur on the State Board of Medical Examiners when the term of Dr. Loren E. Nelson expires December 31, 1983. Physicians interested in serving on the Board of Medical Examiners should contact by September 20:

Dr. Robert Christensen, Chairman
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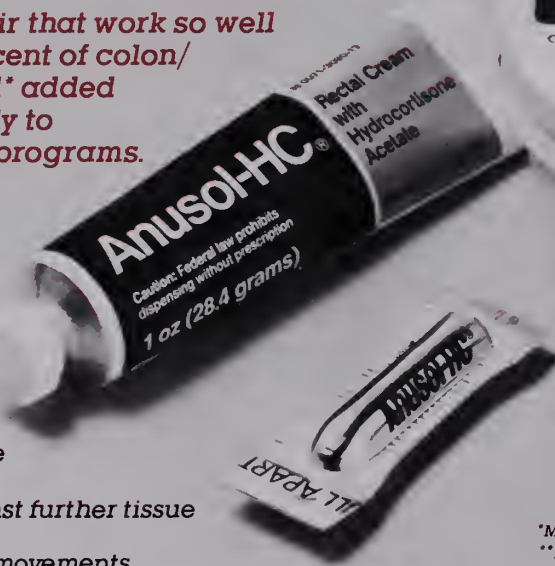
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*Meeting of Am Soc Colon/Rectal Surgeons, May 1980
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Each gram of Anusol-HC Cream contains hydrocortisone acetate, 5.0 mg, bismuth subgallate, 22.5 mg; bismuth resorcin compound, 17.5 mg; benzyl benzoate, 12.0 mg; Peruvian balsam, 18.0 mg; zinc oxide, 110.0 mg; also contains the following inactive ingredients: propylene glycol, propylparaben, methylparaben, polysorbate 60 and sorbitan monostearate in a water-miscible base of mineral oil, glyceryl stearate and water.

Anusol-HC Suppositories and Anusol-HC Cream help to relieve pain, itching and discomfort arising from irritated anorectal tissues. These preparations have a soothing, lubricant action on mucous membranes, and the antiinflammatory action of hydrocortisone acetate in Anusol-HC helps to reduce hyperemia and swelling.

The hydrocortisone acetate in Anusol-HC is primarily effective because of its antiinflammatory, antipruritic and vasoconstrictive actions.

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Anusol-HC is especially indicated when inflammation is present. After acute symptoms subside, most patients can be maintained on regular Anusol* Suppositories or Ointment.

Contraindications: Anusol-HC Suppositories and Anusol-HC Cream are contraindicated in those patients with a history of hypersensitivity to any of the components of the preparations.

Warnings: The safe use of topical steroids during pregnancy has not been fully established. Therefore, during pregnancy, they should not be used unnecessarily on extensive areas, in large amounts or for prolonged periods of time.

Precautions: General: Symptomatic relief should not delay definitive diagnoses or treatment.

Prolonged or excessive use of corticosteroids might produce systemic effects.

If irritation develops, Anusol-HC Suppositories and Anusol-HC Cream should be discontinued until the infection has been adequately controlled.

Anusol-HC is not for ophthalmic use.

Pregnancy: See "WARNINGS"

Pediatric Use: Care should be taken when using the corticosteroid hydrocortisone acetate in children and infants.

Dosage and Administration: Anusol-HC Suppositories — Adults: Remove foil wrapper and insert suppository into the anus. Insert one suppository in the morning and one at bedtime for 3 to 6 days or until inflammation subsides. Then maintain comfort with regular Anusol Suppositories.

Anusol-HC Cream — Adults: After gentle bathing and drying of the anal area, remove the tube cap and apply to the exterior surface and gently rub in. For internal use, attach the plastic applicator and insert into the anus by applying gentle continuous pressure. Then squeeze the tube to deliver medication. Cream should be applied 3 or 4 times a day for 3 to 6 days until inflammation subsides. Then maintain comfort with regular Anusol Ointment.

NOTE: If staining from either of the above products occurs, the stain may be removed from fabric by hand or machine washing with household detergent.

How Supplied: Anusol-HC Suppositories — boxes of 12 (N 0071-1089-07) and boxes of 24 (N 0071-1089-13) in silver foil strips with Anusol-HC printed in black.

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Journal of a Quest for the Elusive Doctor Arthur Conan Doyle (May 12, 1882-June 18, 1882).

Recorded by Alvin E. Rodin, M.D., M.Sc., F.R.C.P. (c). Emended by Jack D. Key, M.A., M.S. Rochester, MN: Davies Printing, 1982. 57pp. Illustrated. \$12.95. (orders to: Jack D. Key, Director of Libraries, The Mayo Clinic, Rochester, MN 55905).

Sir Arthur Conan Doyle (1859-1930) assured his place in literary history through the writing of the Sherlock Holmes stories. However, relatively few acquainted with the adventures of the great detective are familiar with the particulars of the life of his creator, and know that Doyle was a physician. A common view among those conversant with this fact, further, is that Doyle was a failure at the profession and that he left it with a few regrets when his writing career began to take off. Most of the Doyle biographies have done little to dispel this notion which is, essentially, an inaccurate and unfair one.

It was to correct the record that Alvin E. Rodin, Chairman of the Department of Postgraduate Medicine and Continuing Education at Wright State University, and Jack D. Key, Director of Libraries of The Mayo Clinic, embarked on an odyssey of exploration of the medical Conan Doyle. Between them, they have published several articles in recent years covering various aspects of Doyle's medical training and career, his contributions to the literature of the field, and the use of medicine in his fiction. These articles, combined and greatly expanded, are due to be published as a book later this year by the Krieger Publishing Co. This work will go far to restore Doyle's reputation as a physician, and to rescue the details of his accomplishments from oblivion. The book at hand is an offshoot of their efforts, and consists of a day by day account of Rodin's recent

(Book Report continued)

visit to England in pursuit of the "elusive Doctor Arthur Conan Doyle."

At least the outlines of Doyle's medical experiences were known, and served as a start to the investigation. Doyle enrolled in Edinburgh University in 1876 and took the degree of Bachelor of Medicine in 1881 (his M.D. degree followed in 1885). Though his family was a distinguished one, Doyle's own parents were far from wealthy (his father was chronically ill), so that he had to interrupt his studies to serve in a variety of assistantships and to make a voyage as ship's surgeon aboard an Arctic whaler. Following another such voyage to Africa, and a brief, ill-fated association with Dr. George Budd (a classmate from his university days), Doyle set up his own practice in Southsea, a suburb of Portsmouth. He remained there for nine years, building his practice, contributing to medical journals, marrying his first wife, and becoming a well respected member of the community. It was also during this period that Doyle began to attract notice as an author of fiction through numerous short stories (often featuring medical characters and themes), historical novels, and the invention of Sherlock Holmes.

Even his growing practice and his writing did not give Doyle an adequate income, for in addition to his own wife and child he had to provide increasing support to his family back in Edinburgh, his father having died. At the suggestion of a friend, Doyle pursued what he hoped would be a more lucrative aspect of medicine, and in 1891 went to Vienna to study the eye. Following this, he set himself up as an eye consultant in London, but his move proved to be ill-advised for the new specialist could find no patients. Fortunately, by then his writing income had become substantial, and Doyle finally realized he could make more by his pen than his practice. Except for a stint in a volunteer field hospital in South Africa during the Boer War, his profession was forevermore that of a man of letters. It was financial expediency, then, rather than lack of ability which cut short a promising career in medicine.

All of Doyle's experiences were in need of personal investigation, for Rodin and Key had done all they could through secondary sources and correspondence. The trail had grown rather cold owing to years of neglect, but others were now at work on related aspects of Doyle's biography, and among the most interesting parts of Rodin's *Journal* are his accounts of his meetings with them. They included the likes of Owen Dudley Edwards, whose book about Doyle's early years has recently been published, and Richard Green and John Gibson, co-compilers of a comprehensive new Doyle bibliography. Rodin also met Doyle's only surviving child, Dame Jean Conan Doyle, who proved to be delighted with the entire project. All were most generous in their cooperation, and are gratefully acknowledged in the *Journal*. Numerous leads were exposed and followed, many previously untapped resources were exploited, and all that remained was to return home and put some order to it all.

There is also a fair bit of the tourist in the author of this *Journal*, and these elements will perhaps be of more interest to American than to British readers who know (or should know) their own back yards well already. But this is not a book just for Doyle enthusiasts, for anyone interested in the history of medicine will be entertained by this charming chronicle by a fellow student, and encouraged to learn that even at this late date new primary research can still be done on the Victorian era.

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History

The Royal College of Physicians and the Apothecaries in the 17th Century A Dispute for All Seasons

RAYMOND C. BONNABEAU, JR., M.D., Ph.D.*

AS THE MIDDLE AGES ended, medicine was in a state of general confusion. Unskilled practitioners of medicine and surgery were rampant and plying their untalented trade upon an unsuspecting population. Surgery had been further split from medicine due to the decree of Pope Alexander III, at the Council of Tours in 1163, which forbade the shedding of blood by a cleric who had taken holy orders. Thus, surgery had been relegated to the barbers, bathhouse keepers (the massage parlors of the Middle Ages), and to others known for their coarseness and brutality. In an attempt to organize and increase their educational system for apprentices, the Barbers' Company was organized in 1462. A similar group of surgeons (not barbers) had also been recognized in London as early as 1368 and had created a guild of surgeons. This latter group, primarily military surgeons, accompanied the armies during the Hundred Years' War and War of the Roses.

At the start of the Tudor period then, medical care was in the hands of physicians, barber surgeons, and surgeons. In an attempt to upgrade medical care, Henry VIII tried to reduce the number of ill-prepared individuals practicing medicine by a series of acts aimed at assuring competency. He wished to rid the realm of those who caused "grievous hurt, damage, and destruction of many of the King's liege people . . ."

The first of these acts took place in 1511. It decreed that any person wishing to practice medicine within the City of London, or within a seven mile radius, must pass an examination given by either the Bishop of London or the Dean of St. Paul's, assisted by four physicians and expert surgeons. If caught without a license, a fine of five pounds per month of unlicensed practice would be levied. Outside this area, similar examination would be administered by the diocesan bishop. Graduates of Oxford and Cambridge were exempted. After this initial attempt proved ineffectual, another was made to reduce medical mediocrity.

In the year 1518, Henry granted a charter to Cardinal Wolsey and six physicians to form a College of Physicians in London, the chief of these was the humanist, Thomas Linacre. These original members were appointed for life, and given the powers originally vested in the bishops.

Henry, in 1540, united the Company of Barbers and Surgeons with the Guild of Military Surgeons, with Thomas Vicary as its first master. Regulations were drawn up governing their education, conduct, and licensure.

Thus, over a period of 30 years, strong attempts were made to govern the then existing medical establishment. Throughout this period, however, another group, the apothecaries, was permitted to fill the prescriptions of the physicians. Originally part of the Company of Grocers (joining them in 1606), they existed as enough of a significant subspecialty in that guild to warrant consideration as an independent livery company by King James, and the group was brought before the College of Physicians in 1614. Although they had no formal medical training, many did, in fact, treat patients and as such were classified as empirics. These had already been involved in several cases of medical malpractice. One celebrated case was that of a Dr. Sanderson, a clergyman, who was possibly overdosed by means of Aurum Potabile, or essence of gold, the matter being brought before the College of Physicians. The College records indicate that the good theologian had, as he was about to die, complained that he was being killed by the drug, by means of an incurably inflamed throat, the privilege of which cost him £60.

Despite incidents of this nature, and in an effort to prevent them, on the recommendation of the College of Physicians, King James granted the apothecaries a separate charter on 30 May 1616. There were approximately 150 apothecaries in London at the time, while only 30 College fellows. The society was to have a master, two wardens, and 21 assistants, and they must serve an apprenticeship of seven years. No apprentice could be freed unless he was examined by

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the president of the College of Physicians or his deputies. The master and wardens were also given search, seize, and destroy authority in apothecary shops, as were appointed members of the College of Physicians. From this point, the apothecaries sought to better their lot by treating patients without regard of the College injunction and, in fact, seriously infringed on the medical monopoly enjoyed to this point by the College of Physicians. The College felt obligated to curtail this infringement.

Further compromise of the physician's status occurred in the Act of 1543. In that year, a law was passed that stated that anyone (not just surgeons, as previously was the case), could administer medicines *externally* or prepare them from *naturally occurring* botanical materials. This act opened the floodgates to unlicensed practitioners of all kinds by its wording.

Throughout this period the shouldering continued, the apothecaries continuing to practice medicine, sometimes with disastrous results, and the physicians continuing in an attempt to have them suppressed or subordinated to the College.

Both sides had reason for complaints. The apothecaries were disturbed that physicians employed some not belonging to their guild. In turn, the physicians tried unsuccessfully during the 1630s to have the apothecary charter repealed.

During the Civil War things quieted down, since the physicians lost their leverage during the absence of the king. With the Restoration in 1660, they tried again to have the apothecary charter revoked. The real crisis began, however, during the Great Plague year of 1665-66.

London had already become one of the most populous of European urban centers by the year 1600. At that time, when no English town possessed a population greater than 15,000, London had 200,000 souls. In fact, in the year 1657, seven percent of England's population lived in London alone. Thus, the public health problems, scarcely addressed, were quite staggering. Major epidemics of plague were common; two of them, in 1603 and 1625, killed over 80,000 inhabitants. This problem of the high ratio of people to licensed physicians (the College of Physicians, as already mentioned, had only 30 fellows), allowed the unlicensed and the untrained to be welcomed. The number can be imagined if one realizes that between 1550 and 1640 the College of Physicians took action against some 672 unlicensed practitioners. I suspect this was the tip of the iceberg. It was also common practice during these plague years for the most eminent physicians to be the first ones to leave the diseased city. In fact, only three,

Francis Glisson, Thomas Wharton, and Nathaniel Hodges, remained in London during the Great Plague itself, along with most of the apothecaries and surgeons. In short, the College remained elitist and did not meet the needs of the people it served. It did not understand the rapidly changing urban environment. The apothecaries, at least, were visible, and this was their strength.

The abuses were on both sides, however, and as usual in cases of this sort, the patients were caught in between. What sorts of problems arose? If an apothecary had been treating someone and he was not responding, he would be referred to a medical consultant. This generally was someone who would not damage the apothecary's reputation, and might then continue to order expensive drugs. This would function as a kickback of sorts for the referring apothecary. On the other hand, physicians, if they perceived gross malpractice, might not be willing to bring charges which would damage an apothecary's reputation, and thus reduce his (the physician's) own practice. Since apothecaries made an income from the amount and numbers of medications prescribed and not on medical advice given, as physicians did, another area of abuse was available. In one such instance, medications employed to treat a callus on a patient's foot amounted to a bill of £132 12s.8d. The actual cost of the medications was under £7.

An apothecary also used inexpensive ingredients and raised the price, stating that a higher-priced drug had actually been employed. This medication misuse to make money was extremely common and was lampooned by Tobias Smollett, himself a surgeon, in *The Adventures of Roderick Random*, which he wrote in 1748. When describing one of his apothecary characters, he wrote: "However, his expense for medicines was not great . . . I have been sometimes amaz'd to see him, without the least hesitation, make up a physician's prescription, though he had not in his shop one medicine mention'd in it. Oyster-shells he could convert into crab's eyes . . . syrup of sugar into balsamic syrup; . . . and a hundred more costly preparations were produc'd in an instant, from the cheapest and coarsest drugs of the *materia medica*." Other abuses also arose when prescriptions were filled with out-of-date drugs.

The problem of the small ratio — and therefore unavailability — of physicians to potential patients resulted in the establishment at the College of Physicians of a free clinic to treat the poor in 1687, at Warwick Lane. A deal was made with the apothecaries to supply drugs at cost. This truce lasted one year. By July 1688, due to the intense competition by

apothecaries in the patient market, arrangements were made by the physicians to provide their own drugs from a laboratory attached to the College. This finally came to fruition in 1698 with a primary free clinic at the College at Warwick Lane, London, together with two satellite dispensaries, one in Westminster, the other in Cornhill. These dispensaries sold medications at cost and in some cases undercut the apothecaries by 75 percent. Many other methods to stop the treatment of patients by the apothecaries were also tried. These included not giving directions in writing on patients' prescriptions in an attempt to forestall physicians' competitors from obtaining that kind of free information (1679). This was a valid, though somewhat dubious, approach, since the apothecaries already argued that they knew more than individual physicians, since they were privy to all the treatment-prescriptions of a vast array of physicians. It was looked upon as a continuing post-graduate course of the time. The celebrated case of John Seal, patient, vs William Rose, apothecary, in 1703-4 brought the matter to prominence and tipped it in favor of the apothecaries' cause.

Seal had been treated by the apothecary, Rose, over a period of one year at an unbelievable medication cost of L50. After being seen at the College dispensary, he was cured in one week for the even more unbelievable cost of L2. Rose was found liable before the court of Queen's Bench and ordered to pay the plaintiff, Seal, damages of L5. An appeal was made before the House of Lords. The House subsequently reversed the decision in favor of the apothecary defendant, since it was felt that more harm would be done to the public good by removing all apothecary-practitioners than by allowing a few bad ones to go unchecked. No doubt the physicians felt that this decision was a case of the end justifying the means.

Thus, apothecaries could finally officially practice medicine. It is to their credit that they took advantage of educational opportunities becoming increasingly available to improve their professional knowledge and standing. Time healed many wounds, and in 1815, the Society of Apothecaries was finally granted the independent right to issue licenses and to practice medicine.

MINNESOTA MEDICINE Covers

In order to select the best cover pictures for MINNESOTA MEDICINE the cover editor requests that all amateur photographers search slide collections and submit more pictures. The appreciation of beauty is always quite subjective, whereas the selector might find a different picture desirable for the cover. Such factors as the background, the amount of lighting, and the presence of extraneous background images on the slide may make a cover selection less desirable. It is suggested that several of your better pictures be submitted for consideration in the hopes that one might be chosen. Currently the cover editor is in need of photographs starting with next November's edition which would include late fall and winter scenes. It is requested that vertically positioned slides be submitted at this time in order to try a changed cover format.

Bruce Nydahl, M.D.
Cover Editor

Minnesota Medical Association Annual Meeting
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Live Broadcasting on CC-TV and its Effect on Television Viewing Patterns of Hospitalized Children

CHARLES N. OBERG, M.D.*, and LARRY JOHNSON, M.A.†

The study demonstrated that in the afternoon, hospitalized children watch more television than their non-hospitalized counterparts. In addition, when only pre-taped programs were broadcasted on closed circuit television (CC-TV), a small percentage of children selected it as a viewing alternative. However, with one hour of live programming in the early afternoon, a time usually devoid of children's programming, CC-TV cut dramatically into the adult-oriented programs being viewed.

TELEVISION HAS enjoyed tremendous growth since the 1950s. Information from the U.S. Bureau of Census shows that by the year 1974, greater than 95 percent of all U.S. households had a television.¹ Accompanying this rapid growth, an enormous amount of literature regarding the effects of television on children has been generated. By far the greatest amount of research has been in the realm of television violence. The Banduras, with their clarification of observational learning, have shown that children who view aggressive models increase their aggressive behavior.² Gebner³ and his associates undertook a content analysis and demonstrated the extent of violence in commercial programming. Programs directed at young children were particularly violent, with cartoons having the highest frequency documented. In another realm, Friedrich and Stein⁴ have attempted to evaluate television as a tool for transmitting prosocial behavior such as cooperation, sharing and a concern for others. Their consensus is that children can learn prosocial skills from carefully designed programs.

The field of pediatrics has shown an increasing interest in television over the past decade. Dr. H. M. Frankel,⁵ in an editorial correspondence in 1976, addressed the issue with regard to television and its effects on the health of hospitalized children. The Academy of Pediatrics at their annual meeting in 1978 issued a policy statement recommending a ban on television advertising during children programming hours. In 1980, the Academy issued a publication entitled, *Television and the Family*,⁶ which emphasized the need for more parental awareness and parental monitoring of children's viewing patterns.

The question then becomes: what are the viewing patterns of hospitalized children? Guttentag⁷ undertook an extensive project at the Children's Hospital of Winnipeg. The recently published article revealed that, "... daytime viewing is substantially higher for hospitalized than non-hospitalized children and includes more programming which is directed towards adults." In addition, viewing was characterized as excessive and indiscriminate, with the pediatric population literally a captive audience.

The CC-TV channel at Minneapolis Children's Health Center and its live programming offers an innovative and refreshing alternative to commercial broadcasting. Therefore, the following study was undertaken to see what effects a CC-TV channel had on viewing patterns. Several objectives were addressed; First, to see if the amount of hospital television viewing was similar to Winnipeg Children's Hospital. Second, to determine if the CC-TV channel affected program selection. Finally to see if limited live broadcasting could increase the viewing of the closed circuit channel.

Material and Methods

Minneapolis Children's Health Center is a private, nonprofit hospital with a 107-bed inpatient facility.

An audience viewing survey was conducted between November and December of 1981. During this period, 318 patients were observed with regard to their viewing patterns. Every child was observed on half-hour intervals between 1:30 and 4:00 p.m. This time period was selected because it is a time devoid of children's programming, and also because it corresponded to the time the CC-TV channel was available to the patient population. Six weekdays were recorded, including three days during which the channel broadcasted only pre-taped programs

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throughout the afternoon. The other three days were days when one hour of live broadcasting was scheduled between 1:30 and 2:30 p.m. The live program is entitled, "The Electronic Get Well Card." During this program children can play interactive games via television, designed to familiarize them with the hospital. Incorporated into the live show are short 30-60 second taped segments aimed at describing the hospital, the health care team and procedures to be encountered. The overall goal of the live show is to reduce the stress and alienation of the hospital experience and to give words of encouragement to patients with special needs. Following the live broadcast, the remainder of the afternoon is devoted to pre-taped educational programs produced for children. These include video tapes from the Educational Foundation of the American Women in Radio and Television, Inc.⁸ The range is varied from entertainment programs such as the "Big Blue Marble" to more educational programs such as "Mr. Rogers talks about Going to the Hospital."

The observer recorded whether the child was present in the room, whether the TV was on or off, and the program selection. In addition, the observer recorded whether or not the child was visually oriented to the television. A *z* test of proportional differences was utilized for statistical analysis.

Results

In this study, 318 pediatric patients were observed with regard to their weekday afternoon viewing patterns. The age range was from four days to 20 years, with the mean age of four years, two months. In the initial analysis, those patients less than 18 months of age were excluded from the sample. It was felt that the television was provided more for parental convenience than for children in this age group. The subgroup of children and adolescents greater than or equal to 18 months of age totalled 188, with a mean age of six years, nine months. The results will reflect this older age group.

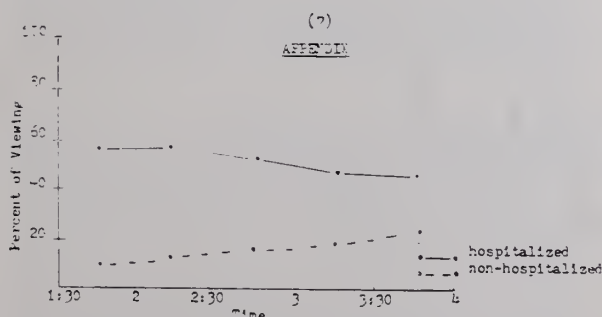


Fig. 1 — The percent of television viewing of hospitalized versus non-hospitalized children.

Viewing was defined as the child in the room with the television on. Figure 1 is a graph of the percent of viewing as a function of time for hospitalized versus non-hospitalized children. The non-hospitalized information is drawn from the Winnipeg study, who published it with permission from the A. Nielson Company. As can be seen from the graph, the total amount of viewing for hospitalized children is greater than non-hospitalized children.

This older age group then was subdivided into those children who viewed on days when only pre-taped programs were aired as compared to those who viewed on days with one hour of live programming on the CC-TV channel. As can be seen from Figure 2, the total percent of viewing was essentially identical for these two subgroups. Therefore, it is evident that the one hour of live programming did not increase the amount of television being watched.

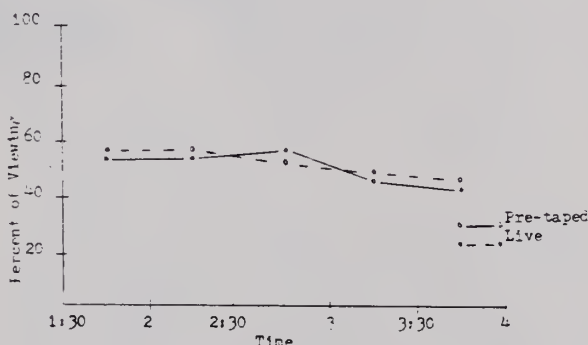


Fig. 2 — The percent of television viewing for hospitalized children on pre-taped versus live programming days.

However, live broadcasting had a dramatic effect on program selection. The next two figures are a graphic comparison of program selection as a function of pre-taped versus live programming on CC-TV. Programs depicted include closed circuit (CC-TV), soap operas (S.O.) and others (O) which include talk shows, game shows, re-runs and the public broadcasting station. Figure 3 represents program selection on the pre-taped days between 1:30 and 2:30 p.m. The proportion viewing soaps is 58 percent with 18 percent for other commercial programs and only 24 percent for CC-TV. Though the pre-taped programming offers an alternative, they have marginal impact with regard to commercial programs. In marked contrast, Figure 4 demonstrates how one hour of live broadcasting can change program selection. The CC-TV channel attracted 60 percent of the viewing audience, cutting significantly ($P < 0.001$) into those previously watching the daily soap operas. It was also shown that after the live program went off the air, a greater percentage of children continued to

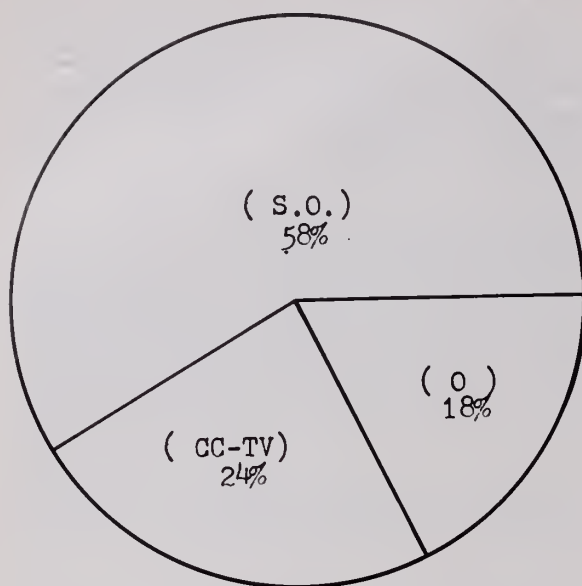


Fig. 3 — Program selection with pre-taped CC-TV.

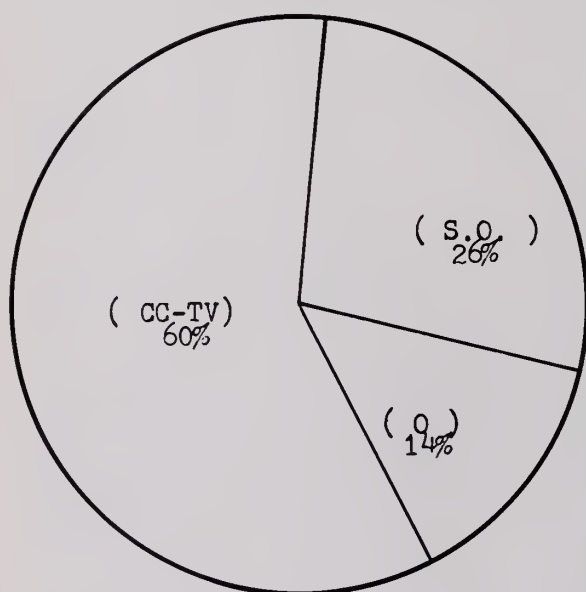


Fig. 4 — Program selection with live CC-TV.

view the educational programs on the CC-TV channel throughout the afternoon.

Children's attention also was recorded and was defined as the child visually oriented to the television set. Figure 5 represents an accumulation of all the 30-minute intervals in each of their respective program type, and the percent attending was calculated

for each.

An impressive 83 percent of children viewing live CC-TV were oriented and attending to the set when the observer was in the room. This is significantly different ($P < 0.001$) than the 30 percent for the soaps.

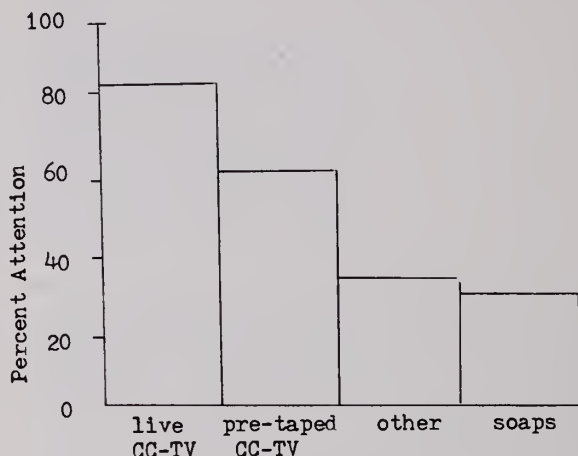


Fig. 5 — Percent attention as a function of program selection.

Discussion

To summarize, it is evident that hospitalized children are indeed viewing more television than non-hospitalized children. In addition, it was clearly shown that live broadcasting on CC-TV does not increase the amount of television being watched. However, the limited use of live programming had a tremendous effect on program selection. This information is relevant to those hospitals with CC-TV capacity who plan or are presently broadcasting only pre-taped programs. The results indicate that pre-taped shows alone have difficulty competing with the commercial station. However, the selective use of live broadcasting, followed by the pre-taped programs, dramatically increased viewing of the CC-TV channel with carry over into the later afternoon. This is a remarkable accomplishment considering the immense popularity of the commercial programs.

Hopefully, this study demonstrates that CC-TV and the implementation of limited live broadcasting is a viable alternative to commercial programming.

Acknowledgement

The authors would like to express their gratitude to the Center for Early Education and Development (CEED) and the Bush Foundation whose support and funding made this project possible.

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Before prescribing, please consult complete product information, a summary of which follows:

Indications: Management of anxiety disorders, or short-term relief of symptoms of anxiety. Anxiety or tension associated with the stress of everyday life usually does not require treatment with an anxiolytic. Symptomatic relief of acute agitation, tremor, impending or acute delirium tremens and hallucinosis due to acute alcohol withdrawal; adjunctively in: relief of skeletal muscle spasm due to reflex spasm to local pathology; spasticity caused by upper motor neuron disorders; athetosis; stiff-man syndrome. *Oral forms* may be used adjunctively in convulsive disorders, but not as sole therapy. *Injectable form* may also be used adjunctively in: status epilepticus; severe recurrent seizures; tetanus; anxiety, tension or acute stress reactions prior to endoscopic/surgical procedures; cardioversion.

The effectiveness of diazepam in long-term use, that is, more than 4 months, has not been assessed by systematic clinical studies. The physician should periodically reassess the usefulness of the drug for the individual patient.

Contraindications: Tablets or capsules in children under 6 months of age; known hypersensitivity; acute narrow angle glaucoma; may be used in patients with open angle glaucoma who are receiving appropriate therapy.

Warnings: As with most CNS-acting drugs, caution against hazardous occupations requiring complete mental alertness (e.g., operating machinery, driving). Withdrawal symptoms similar to those with barbiturates and alcohol have been observed with abrupt discontinuation, usually limited to extended use and excessive doses. Infrequently, milder withdrawal symptoms have been reported following abrupt discontinuation of benzodiazepines after continuous use, generally at higher therapeutic levels, for at least several months. After extended therapy, gradually taper dosage. Keep addiction-prone individuals (drug addicts or alcoholics) under careful surveillance because of predisposition to habituation/dependence.

Usage in Pregnancy: Use of minor tranquilizers during first trimester should almost always be avoided because their use is rarely a matter of urgency and because of increased risk of congenital malformations, as suggested in several studies. Consider possibility of pregnancy when instituting therapy; advise patients to discuss therapy if they intend to or do become pregnant.

ORAL. Advise patients against simultaneous ingestion of alcohol and other CNS depressants.

Not of value in treatment of psychotic patients; should not be employed in lieu of appropriate treatment. When using oral forms adjunctively in convulsive disorders, possibility of increase in frequency and/or severity of grand mal seizures may require increase in dosage of standard anticonvulsant medication; abrupt withdrawal in such cases may be associated with temporary increase in frequency and/or severity of seizures.

INJECTABLE To reduce the possibility of venous thrombosis, phlebitis, local irritation, swelling and, rarely, vascular impairment when used *IV*: inject slowly, taking at least one minute for each 5 mg (1 ml) given; do not use small veins, i.e., dorsum of hand or wrist, use extreme care to avoid intra-arterial administration or extravasation. Do not mix or dilute with other solutions or drugs in syringe or infusion flask. If it is not feasible to administer *Injectable Valium* directly *IV*, it may be injected slowly through the infusion tubing as close as possible to the vein insertion.

Administer with extreme care to elderly, very ill, those with limited pulmonary reserve because of possibility of apnea and/or cardiac arrest; concomitant use of barbiturates, alcohol or other CNS depressants increases depression with increased risk of apnea; have resuscitative facilities available. When used with narcotic analgesic eliminate or reduce narcotic dosage at least 1/3, administer in small increments. Should not be administered to patients in shock, coma, acute alcoholic intoxication with depression of vital signs.

Has precipitated tonic status epilepticus in patients treated for petit mal status or petit mal variant status. Not recommended for OB use.

Efficacy/safety not established in neonates (age 30 days or less); prolonged CNS depression observed. In children, give slowly (up to 0.25 mg/kg over 3 minutes) to avoid apnea or prolonged somnolence; can be repeated after 15 to 30 minutes. If no relief after third administration, appropriate adjunctive therapy is recommended.

Precautions: If combined with other psychotropics or anticonvulsants, carefully consider individual pharmacologic effects—particularly with known compounds which may potentiate action of diazepam, i.e., phenothiazines, narcotics, barbiturates, MAO inhibitors and antidepressants. Protective measures indicated in highly anxious patients with accompanying depression who may have suicidal tendencies. Observe usual precautions in impaired hepatic function; avoid accumulation in patients with compromised kidney function. Limit oral dosage to smallest effective amount in elderly and debilitated to preclude ataxia or over-sedation (initially 2 to 2½ mg once or twice daily, increasing gradually as needed and tolerated).

The clearance of diazepam and certain other benzodiazepines can be delayed in association with Tagamet (cimetidine) administration. The clinical significance of this is unclear.

INJECTABLE Although promptly controlled, seizures may return; readminister if necessary; not recommended for long-term maintenance therapy. Laryngospasm/increased cough reflex are possible during peroral endoscopic procedures; use topical anesthetic, have necessary countermeasures available. Hypotension or muscular weakness possible, particularly when used with narcotics, barbiturates or alcohol. Use lower doses (2 to 5 mg) for elderly/debilitated.

Adverse Reactions: Side effects most commonly reported were drowsiness, fatigue, ataxia. Infrequently encountered were confusion, constipation, depression, diplopia, dysarthria, headache, hypotension, incontinence, jaundice, changes in libido, nausea, changes in salivation, skin rash, slurred speech, tremor, urinary retention, vertigo, blurred vision. Paradoxical reactions such as acute hyperexcited states, anxiety, hallucinations, increased muscle spasticity,

insomnia, rage, sleep disturbances and stimulation have been reported; should these occur, discontinue drug.

Because of isolated reports of neutropenia and jaundice, periodic blood counts, liver function tests advisable during long-term therapy. Minor changes in EEG patterns, usually low-voltage fast activity, observed in patients during and after diazepam therapy are of no known significance.

INJECTABLE Venous thrombosis/phlebitis at injection site, hypoactivity, syncope, bradycardia, cardiovascular collapse, nystagmus, urticaria, hiccups, neutropenia. In peroral endoscopic procedures, coughing, depressed respiration, dyspnea, hyperventilation, laryngospasm/pain in throat or chest have been reported.

Dosage: Individualize for maximum beneficial effect.

ORAL—Adults: Anxiety disorders, relief of symptoms of anxiety—Valium (diazepam/Roche) tablets, 2 to 10 mg b.i.d. to q.i.d.; or 1 or 2 Valrelease capsules (15 to 30 mg) daily. Acute alcohol withdrawal—tablets, 10 mg t.i.d. or q.i.d. in first 24 hours, then 5 mg t.i.d. or q.i.d. as needed; or 2 capsules (30 mg) the first 24 hours, then 1 capsule (15 mg) daily as needed. Adjunctively in skeletal muscle spasm—tablets, 2 to 10 mg t.i.d. or q.i.d.; or 1 or 2 capsules (15 to 30 mg) once daily. Adjunctively in convulsive disorders—tablets, 2 to 10 mg b.i.d. to q.i.d.; or 1 or 2 capsules (15 to 30 mg) once daily.

Geriatric or debilitated patients: Tablets—2 to 2½ mg 1 or 2 times daily initially, increasing as needed and tolerated (see Precautions). Capsules—1 capsule (15 mg) daily when 5 mg oral Valium has been determined as the optimal daily dose.

Children: Tablets—1 to 2½ mg t.i.d. or q.i.d. initially, increasing as needed and tolerated (not for use in children under 6 months). Capsules—1 capsule (15 mg) daily when 5 mg oral Valium has been determined as the optimal daily dose (not for use in children under 6 months).

INJECTABLE Usual initial dose in older children and adults is 2 to 20 mg I.M. or I.V., depending on indication and severity. Larger doses may be required in some conditions (tetanus). In acute conditions injection may be repeated within 1 hour, although interval of 3 to 4 hours is usually satisfactory. Lower doses (usually 2 to 5 mg) with slow dosage increase for elderly or debilitated patients and when sedative drugs are added. (See Warnings and Adverse Reactions.)

For dosages in infants and children see below; have resuscitative facilities available.

I.M. use: by deep injection into the muscle.

I.V. use: inject slowly, take at least one minute for each 5 mg (1 ml) given. Do not use small veins, i.e., dorsum of hand or wrist. Use extreme care to avoid intra-arterial administration or extravasation. Do not mix or dilute Valium with other solutions or drugs in syringe or infusion flask. If it is not feasible to administer Valium directly *IV*, it may be injected slowly through the infusion tubing as close as possible to the vein insertion.

Moderate anxiety disorders and symptoms of anxiety, 2 to 5 mg I.M. or I.V., and severe anxiety disorders and symptoms of anxiety, 5 to 10 mg I.M. or I.V., repeat in 3 to 4 hours if necessary; acute alcohol withdrawal, 10 mg I.M. or I.V. initially, then 5 to 10 mg in 3 to 4 hours if necessary. Muscle spasm, in adults, 5 to 10 mg I.M. or I.V. initially, then 5 to 10 mg in 3 to 4 hours if necessary (tetanus may require larger doses); in children administer *I.V. slowly*; for tetanus in infants over 30 days of age, 1 to 2 mg I.M. or I.V., repeat every 3 to 4 hours if necessary; in children 5 years or older, 5 to 10 mg repeated every 3 to 4 hours as needed. Respiratory assistance should be available.

Status epilepticus, severe recurrent convulsive seizures (I.V. route preferred), 5 to 10 mg adult dose administered slowly, repeat at 10- to 15-minute intervals up to 30 mg maximum. Repeat in 2 to 4 hours if necessary, keeping in mind possibility of residual active metabolites. Use caution in presence of chronic lung disease or unstable cardiovascular status. Infants (over 30 days) and children (under 5 years), 0.2 to 0.5 mg slowly every 2 to 5 min., up to 5 mg (I.V. preferred). Children 5 years plus, 1 mg every 2 to 5 min., up to 10 mg (slow I.V. preferred); repeat in 2 to 4 hours if needed. EEG monitoring may be helpful. In endoscopic procedures, titrate I.V. dosage to desired sedative response, generally 10 mg or less but up to 20 mg (if narcotics are omitted) immediately prior to procedure; if I.V. cannot be used, 5 to 10 mg I.M. approximately 30 minutes prior to procedure. As preoperative medication, 10 mg I.M.; in cardioversion, 5 to 15 mg I.V. within 5 to 10 minutes prior to procedure. Once acute symptomatology has been properly controlled with injectable form, patient may be placed on oral form if further treatment is required.

Management of Overdosage: Manifestations include somnolence, confusion, coma, diminished reflexes. Monitor respiration, pulse, blood pressure; employ general supportive measures, I.V. fluids, adequate airway. Use levaterenol or metaraminol for hypotension. Dialysis is of limited value.

How Supplied:

ORAL Valium scored tablets—2 mg, white; 5 mg, yellow; 10 mg, blue—bottles of 100 and 500; Prescription Paks of 50, available in trays of 10; Tel-E-Dose® packages of 100, available in trays of 4 reverse-numbered boxes of 25 and in boxes containing 10 strips of 10.

Valrelease (diazepam/Roche) slow-release capsules—15 mg (yellow and blue), bottles of 100; Prescription Paks of 30.

INJECTABLE Ampuls, 2 ml, boxes of 10; Vials, 10 ml, boxes of 1; Tel-E-Ject® (disposable syringes), 2 ml, boxes of 10. Each ml contains 5 mg diazepam, compounded with 40% propylene glycol, 10% ethyl alcohol, 5% sodium benzoate and benzoic acid as buffers, and 1.5% benzyl alcohol as preservative.



Screening for Depression in Hmong Refugees

MARK L. JACOBSON, M.D.* and TERRY W. CROWSON, M.D.†

Forty-three adult Hmong refugee patients were screened for depression in a primary care clinic using the Zung Self-Rating Depression Scale. Results show 65.1% of patients having scores suggestive of depression.

HUMAN DISPLACEMENT and migration have long been associated with significant psychiatric and adaptational problems. Psychiatric illnesses are more prevalent in immigrants and especially in refugee populations where anxiety, reactive psychosis, and somatization are common.¹⁻³ The United States is currently experiencing a large influx of refugees who may suffer from multiple adaptational problems. One such group of refugees is the Hmong of the Laotian highlands. This group of refugees has fled the communist regime of Laos because of reprisals against the Hmong for their previous support of the United States during the Viet Nam conflict. Most Hmong have come to the United States via refugee camps in northern Thailand. In this report, results of screening for depression in Hmong refugees presenting to primary care clinics are described.

Methods

Forth-three adult Hmong refugees presenting to St. Paul-Ramsey Medical Center internal medicine primary care clinics were studied. A convenience sample of new patients was selected based upon the availability of professional interpreters. Prior to evaluation by internal medicine second year residents, the interpreters obtained consent and the following demographic data: age, sex, marital status, number of persons living in the household, amount of time spent in refugee camps, amount of time in the United States, amount of time in Minnesota, ability to speak English, and educational level. The Westermeyer-Vang translation of the Zung Self-Rating Depression Scale was administered verbally by the interpreter. Charts were reviewed at a later date to determine the presenting complaint and the physician's diagnosis. Data were analyzed for significance by the Chi Square Test and by Odds Ratio Method.

The Zung Index

The Zung Depression Scale is a well described and

validated screen for depression.⁴⁻⁷ It has been successfully administered verbally⁷ and cross-culturally.⁸ It consists of twenty items clinically suggestive of depression. Zung correlates index scores of 50-59 with mild to moderate depression, 60-69 with moderate to severe depression, and equal or greater than 70 with severe depression. Scores of greater than 63 are generally found in patients hospitalized for depression.⁹

Results

Eleven males and thirty-two females were tested. Twenty-eight patients (65.1%) had Zung Index scores of greater than or equal to fifty which is suggestive of some degree of depression. Ten patients had scores of equal to or greater than 63 which is generally associated with patients hospitalized for depression. By contrast, only one patient complained of depression and only five patients were diagnosed as depressed or had depression mentioned on their charts. In those patients with scores suggestive of depression, the diagnosis of depression was made in 32.1% of cases.

Chi Square testing demonstrated no statistically significant relationship between the Zung Index scores and age, sex, marital status, number of persons in the household, amount of time in the refugee camp, amount of time in the United States, amount of time in Minnesota, ability to speak English, or educational level. Neither the patients' chief complaints nor the physicians' diagnoses proved to be statistically significantly related to the Zung Index scores at this sample size. Though not statistically significant, the following trends were noted: women, residents of larger household, and patients who had resided in the United States for longer periods of time had higher scores. Patients with longer stays in refugee camps in Thailand had lower scores.

Comments

The Hmong are the most recent group of refugees to seek haven in the United States. The shift from a tribal culture of the Laotian highlands to a highly technological western culture presents many adap-

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tational difficulties. In 1932, Odegaard first demonstrated such adaptational difficulties by reporting a higher incidence of mental disorders in Norwegian-born immigrants to Minnesota compared to Norwegians who were born in Minnesota.¹⁰ Studies in various cultures have demonstrated an increased incidence of depression, schizophrenia, and psychosis among migrators. More recently, evaluation of Vietnamese refugees have documented similar findings.¹⁻³ While a significant prevalence of depression could thus be expected in the Hmong refugee population, it is surprising that the prevalence is as high as sixty-five percent. In the general American population, the Zung Index has demonstrated a depression prevalence of 4-24%.⁹ In studies of medical outpatients, the prevalence of depression has been found to be 16-52%.⁷ The Hmong population screened was an outpatient population and is likely to have a higher prevalence of depression than the general Hmong population. While the Zung Depression Scale has been validated in several cultural settings, in-

cluding Asian cultures,⁸ it has not yet been applied to the Hmong community as a whole. However, preliminary evaluation of the Hmong community in the St. Paul-Minneapolis area does suggest that the scale is valid for this group of people.*

Only one in three refugees was correctly considered to be possibly depressed by physicians in this clinic setting. The majority of high scoring screenees were undiagnosed. Communication and cultural barriers inherent in caring for this population present major obstacles to accurate diagnosis. Even with excellent interpreter services, much of the verbal and most of the nonverbal communications are lost. Furthermore, this study found no demographic clues or chief complaints that might alert physicians to the possibility of depression. Thus, only by becoming aware of the high prevalence of depression in these patients can professionals begin to assess the relationship of depression to clinical presentation. The Zung Depression Scale is a useful screening tool for finding depression in this population and may be well used as a diagnostic adjunct.

*Personal communication from Dr. J. Westermeyer, University of Minnesota Statistical Reviewer — Cindy Leffler, Minnesota State Department of Health.

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Cover Photograph "Tranquility"

Dr. Charles G. Sheppard, with an eye for beauty, caught the cover photograph with his camera on his way home from the office. He told the Editors that after taking the photo, he did not want to leave the area because of its beauty and the serenity.

A past president of the Minnesota Medical Association, Dr. Sheppard has been actively involved not only in the practice of psychiatry but also in organized medicine. He has been awarded the Distinguished Teaching Award of the Minnesota Medical Foundation, hosted a delegation of Minnesota medical leaders on a goodwill people-to-people mission through Europe, recipient of the University of Minnesota's Harold S. Diehl Award in 1963, selected by the *Ladies Home Journal* magazine in 1950 as a typical general medical practitioner, served on three governors' committees — mental health, aging, and tuberculosis; and was appointed by Governor Harold LeVander medical director for the Minnesota Security Hospital in St. Peter.

He has been a Speaker of the MMA House of Delegates, a Councilor of the Fourth District, and chaired and served on many committees.

Informed Consent vs. Consent Forms

KENNETH DEDEKER, M.D.*

THE CONCEPT of informed consent has grown out of the basic legal and moral principle that each individual is entitled to control what shall or shall not be done to his/her body. This was well stated in 1914 by Justice Cardoza when he stated, "Every human being of adult years and sound mind has a right to determine what shall be done with his own body and a surgeon who performs an operation without his patient's consent commits an assault for which he is liable in damages."¹

Since that time, numerous court decisions have reaffirmed and expanded this doctrine. Additional responsibility has been placed on the medical profession to give enough information to the patient that he/she may be truly informed about the treatment options before consenting to treatment.

Informed Consent

Informed consent itself may be defined as the duty of the physician "to explain the procedure to the patient and to warn him of any material risks or dangers inherent in or collateral to the therapy, so as to enable the patient to make an intelligent and informed choice about whether or not to undergo such treatment."²

Thus informed consent itself is primarily an issue between a patient and his/her physician "to make a full and frank disclosure to the patient of all pertinent facts related to his illness."³ Whenever possible, this process should take place in a relatively relaxed setting where sufficient time may be taken for a thorough disclosure by the physician and for the patient's questions to be answered. Items to be discussed and recorded in the medical record should include:

(1) Nature of the disease. (2) Nature of the proposed treatment. (3) Expected benefits. (4) Expected outcome with and without a treatment. (5) Alternative forms of treatment. (6) Problems of recuperation. (7) Risks: (a) Degree (b) Death (c) Disability (d) Disfigurement.

Each individual physician who renders care should obtain appropriate informed consent for his/her own phase of the patient's care: the surgeon for surgical procedures, the radiologist for radiologic procedures, the anesthesiologist for anesthesia, etc. If there is another primary care or attending physician, he/she is also responsible for assuring that adequate informed consent has been obtained.

Exactly how detailed such an explanation and note should be is somewhat problematical. Many courts moving away from the time-honored professional standard have adopted a "material risk" standard of disclosure. A material risk is defined as: "A reasonable person, in what the physician knows or should know to be the patient's position, would be likely to attach significance to in deciding whether or not to forego the proposed therapy."⁴

Whether a risk is material and must be disclosed must be measured from the standpoint of a reasonable patient. Exceptions to this may arise in emergencies and some special therapeutic circumstances.

*Medical Director, North Star Casualty Services, Inc., Minneapolis.

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Consent Forms

Consent is based on a principle of law that the individual shall be the sole arbiter of who shall and who shall not touch him. Touching another without authorization to do so may be considered a legal wrong called "battery." The law specifically requires consent for intentional touching which involves medical or surgical procedures to be performed on a patient; the only exception would be an emergency situation.

Most consent forms as utilized by hospitals serve as useful vehicles in preventing these assault and battery charges, but seldom contain the essential elements of informed consent. An adequate consent form should include: (1) Identity of the patient. (2) Name of the actual physician(s) who will perform the procedure/treatment. (3) Date of the consent. (4) What is to be done — preferably in lay terminology. (5) Authorization for the *specific type* of anesthesia to be used. (6) Identity and relationship of the individual giving consent.

There is no indication on consent forms that the patient understands what he/she is consenting to. An authorization from a patient without full understanding of what he/she is consenting to is not *informed* consent.

Hospital Responsibility

Court decisions seem quite clear that it is solely the responsibility of the attending physician to obtain informed consent from the patient. The hospital may, however, be held responsible if the physician has an exclusive contract with the hospital for the rendering of specific services. The hospital could also be held vicariously liable if the patient is led to believe that the physician is acting as an agent of the hospital. The hospital is responsible for any battery committed by an independent contractor where the hospital knew or should have known that consent had not been obtained. While no cases have required a hospital to assure that a physician has obtained informed consent, there is potential liability for failure to do so. Furthermore, a hospital's own policies, JCAH* standards, and other state or federal programs may impose a responsibility on the hospital for assuring that informed consent has been obtained.

*The JCAH requires that, "The medical record shall contain evidence of informed consent for procedure or treatment for which it is appropriate."⁵ Thus, JCAH accredited hospitals may be held to this standard.

References

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3. Informed Consent: I — L. Miller; JAMA No. 7; 1980 — Volume 244, No. 18
4. Canterbury vs. Spencer; 464 F 2d 772 (DC Cir 1972) Cobbs vs. Grant, 502 P 2d 1 (Calif. 1972)
5. 1983 JCAH Accreditation Manual for Hospitals

Minnesota Association of Blood Banks Fall Meeting

Sheraton Park Place Hotel, Minneapolis, MN

September 30, and October 1, 1983

A Scientific Symposium on the Adverse Effects of

Blood Transfusion and a Selection of Workshops

Workshops I, II, III, IV

Registration: 8:00 A.M.

Friday, September 30, 1983

Program: 8:30-11:45 A.M.

Contact: Roslyn Yomtovian, M.D., 1406 Sixth Ave., St. Cloud 56301

Hospice Care Program

Metropolitan Medical Center

I.E. FORTUNY, M.D.*; NEVA HANSEN, R.N.;† PATRICIA DWYER, R.N.‡; SHARON FISCHSTROM, R.N.;‡
JUDY MATA, R.N.;‡ and ANNE O'BRIEN, R.N.#

The Hospice Care Program of the Metropolitan Medical Center, Minneapolis, MN (MMC), has been open since October 1980. The inpatient program has nine beds, admits 11.6 patients monthly, and has an average stay of 7.6 days. The outpatient portion of the program accounts for 75 percent of the dying days while 25 percent of days are spent as inpatients. Physician referring patients include eight family practitioners, 34 internists, 12 surgeons, four oncologists, three pulmonary disease specialists, and eight nephrologists. In caring for dying patients, Hospice staff members follow standards and principles delineating criteria for the irreversibility of the dying process, the physician's and nurse's roles, and definition of signs, symptoms, and language of dying.

THE METROPOLITAN MEDICAL CENTER inpatient Hospice program was opened October 1980, eight months after a Home Hospice Program had been in operation. Nine beds were designated for the inpatient service; staffed as follows: (1) Registered nurses 9.5; (2) nursing assistants 2.8; (3) communicator transcriber 0.6; (4) chaplain 1; (5) clinical pharmacist 1; (6) recreational therapist 1; (7) dietician 1; (8) volunteers 8.

The description of the patient population (Table 1) is self-evident, and, as expected, the program is heavily used for cancer patients.

The average monthly admission rate is 11.6 patients, with an average stay of 7.6 days. The home care program cares for 75% of the dying days, while 25% of these days are spent inpatient. A total of 157 patients have died in the hospital.

The number of physicians utilizing the program has risen steadily, and by specialty, their numbers, whether they have had one patient admitted or more, are as follows: eight family practitioners; 34 internists; twelve surgeons; four oncologists; three pulmonary disease specialists; and eight nephrologists.

The inpatient Hospice depends heavily on the MMC patient population, but it does accept patients from other hospitals.

Standards and Principles

Based on the Standards and Principles outlined by

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‡Hospice Staff Nurse.

#Medical Nursing Director, Metropolitan Medical Center.

the National Hospice Organization,¹ the program was designed to service the needs and care of the dying patient as if he/she would stay at home until death. We recognized the need for defining specific criteria (irreversibility of disease process, physician and nurse's roles) as well as the need for clear nomenclature (dying, death, type of symptoms, level of care, etc.). These have been gradually accepted by the physicians utilizing the Hospice Care Program at MMC.

Irreversibility of the Disease Process

The physician recognizes the futility of continuing to administer specific and customary therapies, evaluates the real worth of available experimental programs, and then decides whether the dying process has indeed started. At this point, he discusses his assessment with the patient and family. If an experimental program is chosen by them, then he proceeds with it. If their choice is to allow the patient to die in comfort, peace, and dignity, the Hospice Care Program is offered as an alternative. This offer is accompanied by an explanation of the futility of resuscitation efforts and by a description of the symptomatology and expected mode of death of the ongoing process.

Physician's Role is to treat symptoms, avoid further diagnostic procedures when complications arise, explain the reasons for symptoms and offer alternatives to deal with them, reinforce patient and family on the soundness of their decision, support the nursing staff in their evaluation and opinions in

helping patient and family through the process of dying.

Nurse's Role is to provide general nursing care, to educate patient and family in the meaning of symptoms and the alternatives to reverse them, to inform the physician and engage his help in preventing a crisis,^{2,3} to recognize their own limitations and thus prevent being the cause of or a participant in the crisis, to begin facing with those involved the grieving process.^{4,5}

Nomenclature: Used by physicians and nurses in their communications (verbal or written).

I. Avoid using terminal and substitute it with dying, death for passing away, and palliation for appropriate treatment to solve or modify the symptoms.

II. Symptoms are recognized as either avoidable or unavoidable.

A. Avoidable symptoms are guided towards comfort, and their treatment will not alter the duration of the dying process. They interact but may present as predominantly: physical, emotional, and behavioral (Table 1). Therapeutic measures to relieve these symptoms constitute the critical care of the dying.

B. Unavoidable symptoms are either a direct consequence of the irreversible disease process or indirect independent physiologic malfunctions of systems (cardiac, hepatic, renal, CNS) that will become the final cause of death. Any effort to institute diagnosis and treatment (heroics) will only prolong the crisis of dying

TABLE 1
Distribution of Population: Sex, Age, and Disease
(Oct. 1980-Oct. 1982)

Female	177
	- 303 Total
Male	126
Average Age	62.5
Cancer	270
Renal	13
CNS	10
Cardio-pulmonary	10

and rekindle false hope to both the patient and family. For the physician it will increase the feeling of failure, resulting in anxiety and loss of objectivity. So when these complications arise, it helps to remember that laboratory testing, roentgenograms, irradiation, monitors, removal of effusions, and treatment of infections will only begin a fruitless pursuit and interfere with the control of the crisis by prolonging it.

III. Level of care will be determined by the type of symptoms or signs, and the clinical assessment of their nature (critical-chronic). Objective and subjective correlation is necessary before care is given (Table 2).

IV. Final evaluation:

Before the patient is accepted in the program, the Hospice Director (physician and/or nurse) confirms the understanding of the criteria and the terminology by asking the attending physician the following questions:

1. Hospice care is aimed at home care, the inservice to be used for preparation to going

TABLE 3
Signs and Symptoms

Subjective Evaluation	Objective Evaluation
1. Pain	1. Location and physical findings
2. Anorexia, thirst, swelling	2. Determination of clinical cause
3. Nausea and vomiting	3. Determination of clinical cause
4. Constipation or diarrhea	4. Determination of clinical cause
5. Fever, chills, productive cough	5. Diagnosis of source of infection
6. Increased questioning about self, restlessness, increased perspiration, insomnia, voice pitch change, tremulousness, heart palpitations, rapid breathing with a sensation of choking (anxiety)	6. Increased muscle tension, tachycardia, tachypnea (hyperventilation), verbalization at an increased rate with varying degrees of awareness and attention
7. Disorientation	7. Time, place, object and person
8. Difficulty in expressing thoughts, feeling of or actual immobility, unrealistic as to place and reasons for being there (panic)	8. Dilated pupils, pallor, listlessness and inability to participate in self-care (hygiene, feeding)
9. Hopelessness, helplessness, powerlessness, quietness, sleeplessness, or desire to sleep more, non-desire to relate to others (depression)	9. Non-complaining, not able to sustain eye contact, indifference to offer of help.
10. Expression of grief includes: Sense of loss of self or others; expressing such distress; aberrations of eating, sleeping, or normal activities; inability to communicate directly with family members; manipulation of others to express their concern about altered behavior.	10. What are patient's concerns, fears, and wishes regarding care? Frustrations, regrets, needs to vent anger? Checking back tears and fears? Inappropriately accepting of all events? Clarification between fear of suffering and fear of dying, or both.

home or nursing home, or if the patient is home when a crisis develops, readmission to in-Hospice.

2. Confirmation of irreversibility of disease process and the physician's willingness to: write the order to not resuscitate, discontinue all previous measures, except for those directed towards correction of avoidable symptoms, continue to care for the patient. Help is offered to the attending physician in explaining any of the above to the patient and family.

Conclusion

We have specifically defined the process of dying and described the meaning of acute care as well as the

signs, symptoms, and nomenclatures of the process. In our opinion, this approach is unique to the Hospice Care Program at Metropolitan Medical Center.

TABLE 2

Avoidable Symptoms

1. **Physical:** pain, fever, nausea, vomiting, anorexia, constipation or diarrhea, dysuria, shortness of breath, insomnia, irritability, confusion.
2. **Emotional:** impairment of reality (environment, persons, physical symptoms) leading to: disorientation, flight of ideas, paranoia, delusions or hallucinations.
3. **Behavioral:** applicable to both patient and family: impatience, unreasonable demands and expectations. Inability to maintain routine schedules (sleep, social activity, physical rest, etc.). Behaviors associated with cognitive inefficiency, somatic obsession, fears, guilts, and impairment of the quality of life.

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3. Glaser, BG, Strauss, AL. The social loss of dying patients. *Amer J Nurs* 64:119,

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1. Chapman: Effect of Coronary Care on Myocardial Infarct Mortality. *Brit Heart J* 42:386, 1979.
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Interspecialty Council Highlights

Current Activities of the Interspecialty Council

June 1983

CME Co-Sponsorship

MMA accreditation as a CME provider requires "integral involvement" in the planning of any CME activity that it co-sponsors with other organizations for Category I credit. In the past, the Committee on Medical Education has been somewhat lenient about requiring one of its representatives to be involved in the planning of these activities. Beginning January 1, 1984, the Committee on Medical Education will not co-sponsor CME activities with other organizations unless a physician, specifically designated by the Subcommittee on CME Resources, is involved in the initial planning of the co-sponsored activity. This will require the society's program chairman, seeking co-sponsorship with the MMA, to contact the MMA office and request an MMA representative at the beginning of the planning stage. Ms. Eugenia Kassir is the MMA staff contact.

An annual "Seminar for CME Directors", sponsored by the MMA, will be held on November 11-12, 1983. All specialty societies are encouraged to have their program chairman attend this seminar. The Committee on Medical Education will recognize anyone who attends this seminar as one of the MMA representatives for CME planning.

Physicians Marketing Services and Practice Management Program

This new innovative program, approved by the House of Delegates, will include:

- ongoing research and analysis of new developments concerning the organization, delivery and financing of health care services.
- development and maintenance of a data base which would be the definitive source of information in Minnesota concerning physicians and the practice of medicine.
- a multi-faceted communications program will be conducted with the objective of selling our side of the story, denoting the outstanding quality of American medicine and the tremendous advances in technology.
- activities designed to assist physicians to function more effectively in a competitive health care marketplace.
- a range of related marketing and practice management services would be available to individual physicians, medical groups, hospital medical staffs and others.

The program is budgeted for \$130,000, the major contributor to the \$35.00 dues increase approved by the House.

Available Reports

Available, for further information, are two reports which have been approved by the MMA Board. They are: (1) a background report on the financing of medical education and research in a competitive environment and (2) a background report on health manpower.

Workers Compensation

About 80% of the recommendations from the MMA's Ad Hoc Committee on Workers Compensation Report have been written into the law passed by the State Legislature this spring. However, the MMA was not successful in getting the fee schedules repealed. Existing law requires 75% of the fees paid for workers comp be lower than the average fees charged in the previous year. Enforcement of this provision has not taken place, because fee information has not been available from the insurance industry.

The new law requires the Minnesota Board of Medical Examiners to develop rules requiring continuing medical education in workers compensation for physicians who "regularly" treat workers comp cases.

INTERSPECIALTY COUNCIL HIGHLIGHTS

Early in June, the Commissioner of Labor and Industry requested MMA recommendations for the physician members on a Medical Services Review Board. This 13-member board (including six places for physicians) will deal with quality of care and cost containment, make recommendations in disability ratings and review fees. It will be the Board's responsibility to rate the cost effectiveness of specific treatment modalities, however, MMA does not advocate this responsibility. The six specialties recommended to the Commissioner, based on the frequency with which they saw workers comp cases were: Family Practice, Orthopedics, Internal Medicine, Neurology and/or Neurosurgery, Physical Medicine and Rehabilitation, and Occupational Medicine.

The Commissioner has requested also, input from the MMA on permanent/partial impairment guidelines. Several task forces have been established by the Ad Hoc Committee on Workers Compensation to update the old AMA Guidelines. When completed, the new set of guidelines will be distributed to Minnesota physicians.

MMA Sponsored Workshop

Two introductory Courses for X-Ray Machine Operators who are not Radiologic Technologists have been tentatively scheduled for October 29, 1983 and April 28, 1984. For further information contact Nancy Daley, Workshop Coordinator at the Minnesota Academy of Family Physicians, Suite 426, 2221 University Ave. S.E., Minneapolis, MN 55414 or call 612/623-9559.

If you have any questions concerning the above, please contact your Interspecialty Council representative.

Interspecialty Council Representatives

MN Allergy Society William Schoenwetter, M.D., 612/927-3091	MN Association of Ophthalmology Raymond Croissant, M.D., 612/927-7138
MN Society of Anesthesiologists Russell H. Larsen, M.D., 612/373-8826	Minnesota State Orthopedic Society Joseph Zeleny, M.D., 612/251-4170
MN Dermatologic Society John Stansbury, M.D., 612/339-3095	MN Society of Clinical Pathologists Richard W. Anderson, M.D., 612/221-1719
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MN Society of Neurological Sciences John Gates, M.D., 612/221-3700	MN Surgical Society John Sanford, M.D., 218/722-8364
Association of Neurologists of Minnesota Lawrence Schut, M.D., 612/588-0661	MN Thoracic Society F. L. Rasp, M.D., 612/333-2156
MN Obstetrical and Gynecological Society M. Ismail Barrada, M.D., 612/298-8414	MN Urological Society Thomas Love, M.D., 612/224-7543
North Central Occupational Medical Association Frank Ubel, M.D., 612/733-5181	Robert Christensen, M.D., Chairman, Interspecialty Council 612/445-1305
MN Academy of Ophthalmology & Otolaryngology Ekrem Gozum, M.D., 612/920-4595 — OTO James Trautmann, M.D., 507/284-2511 — OPH	

Minnesota Medical Association

CME in Minnesota

Provided through the Medical Education Subcommittee on CME Resources

For assistance with scheduling meetings, please contact the MMA office (address and phone given below) for information on future medical meetings and CME courses at the state and national level.

Information for each entry is arranged as follows: Date: Name of program: Primary sponsor: Location: Contact person.

September, 1983

12-16 Radiology/83 Special Imaging; U of M: West Bank Auditorium, Willey Hall; CONTACT CME U of M, Box 293, Mayo Memorial Bldg., 420 Delaware Street S.E., Minneapolis, MN 55455; 612/373-8012.

12-23 First Annual Graduate Occupational Health and Safety Institute; U of M Medical School & Midwest Center for Occupational Health and Safety; Earle Brown Center, U of M; CONTACT: Ruth McIntyre, St. Paul-Ramsey Medical Center, 640 Jackson Street, St. Paul, MN 55101; 612/221-3992.

16-17 Orthopedic Nursing in the 80's; Metropolitan Medical Center and Hennepin County Medical Center; Pillsbury Auditorium Hennepin County Medical Center; CONTACT: Rose Jagodzinski, 701 Park Ave. S., Orthopedic Office 813, Minneapolis, MN 55415; 612/347-2812.

16-17 Annual Meeting, Minnesota Orthopedic Society; Minneapolis; CONTACT: Jack M. Bert, M.D., 307 Gallery Medical Bldg., 17 W. Exchange St., St. Paul, MN 55102.

16-17 Pediatric Update for Primary Care Physicians; St. Paul-Ramsey Medical Center and U of M Medical School; The Saint Paul Hotel; CONTACT: Ruth McIntyre, 640 Jackson Street, St. Paul, MN 55101; 612/221-3992.

19-21 Pulmonary Disease — 1983; Mayo Clinic; Rochester; CONTACT: Postgraduate Courses, Mayo Clinic, 200 1st St. S.W., Rochester, MN 55905; 507/284-2085.

20 Annual Meeting, MN Physiatrie Society; Edgewood Restaurant, Cannon Falls; CONTACT: Donald J. Erickson, M.D. Emeritus, Mayo Clinic, Rochester, MN 55901.

21 Medical Chest; Central Mesabi Medical Center; Central Mesabi Medical Center; CONTACT: Ben P. Owens, Mesaba Clinic, Hibbing, MN 55746; 218/262-3441.

22-24 6th Annual Trauma and Critical Care Seminar; U of M; Hennepin County Medical Center; CONTACT: Donald M. Jacobs, HCMC, 701 S. Park, Minneapolis, MN 55415; 612/347-2810.

23-24 Advanced Trauma Life Support Course; American College of Surgeons State Committee on Trauma, UMD, and St. Luke's Hospital, Duluth, MN; CONTACT: Charles L. Barbee, M.D. ATLS Physician Course Director, 1000 First St., Duluth, MN 55805; 218/727-7259.

26-28 Clinical Microbiology Reviews; Mayo Clinic, Rochester; CONTACT: Postgraduate Courses, Mayo Clinic, 200 1st Street S.W., Rochester, MN 55905; 507/284-2085.

28-30 Obstetrics & Gynecology; U of M; Holiday Inn, Nicollet Mall, Minneapolis; CONTACT: CME, U of M Box 293 Mayo Memorial Bldg., 420 Delaware Street S.E., Mpls. MN 55455; 612/373-8012.

30 Northwestern Pediatric Society Annual Meeting; Chanhassen; CONTACT: Frederic Kleinberg, M.D., Mayo Clinic Rochester, MN 55905; 507/284-2922

September 30-October 1 Vascular Disease; Methodist Hospital and St. Louis Park Medical Center Research Foundation; Radisson South; CONTACT: Elaine Anderson, Assistant Director of Medical Education, 5000 W. 39th Street, Minneapolis, MN 55416; 612/927-3703.

30-1 Fall Meeting — Minnesota Association of Blood Banks, Scientific Symposium on the Adverse Effects of Blood Transfusion Therapy with a Mini Symposium on the Acquired Immune Deficiency Syndrome; Minnesota Association of Blood Banks, Sheraton Park Place Hotel, Minneapolis; CONTACT: Roslyn Yomtovian, M.D., 1406 6th Avenue North, St. Cloud, MN 56301; 612/251-2700.

October, 1983

5-7 Internal Medicine Review (10th Annual Course); U of M, Mayo Memorial Auditorium CONTACT: CME, U of M, Box 293 Mayo Memorial Building, 420 Delaware Street, S.E., Minneapolis, MN 55455; 612/373-8012

5, 11, 12 Basic Life Support Instructor Program; Methodist Hospital; Methodist Hospital; CONTACT: Mary Ann Kempcke, Methodist Hospital, 6500 Excelsior Blvd., P.O. Box 650, Minneapolis, MN 55440; 612/932-5167.

8 Current Trend in Ophthalmology — 7th Annual; Mount Sinai Hospital, Minneapolis; CONTACT: Evelyn Peterson, Medical Staff Office, Mount Sinai Hospital, 2215 Park Avenue, Minneapolis, MN 55404; 612/871-3700 ext. 1117.

12-15 Principles of Colon & Rectal Surgery; U of M; Mayo Memorial Auditorium, U of M; Mayo Memorial Auditorium, U of M; CONTACT: CME, U of M, Box 293 Mayo Memorial Building, 420 Delaware Street, SE, Minneapolis, MN 55455; 612/373-8012.

13-22 Advanced Cardiac Life Support Course; Methodist Hospital; Methodist Hospital; CONTACT: Joan Peterson, M.D. Methodist Hospital, 6500 Excelsior Blvd., P.O. Box 650, Minneapolis, MN 55440; 612/932-5419.

14 Annual John R. Sebold Memorial Symposium — Arthritis of the Upper Extremity; Bethesda Lutheran Medical Center & Metropolitan Hand Surgery Asso. P.A.; College of St. Thomas, O'Shaughnessy Education Center; CONTACT: Rose Baumann, Metropolitan Hand Surgery Asso. P.A., 280 North Smith Avenue, Room 840, St. Paul, MN 55102; 612/291-8773.

14 Cardiovascular Disease; U of M; CONTACT: CME, U of M, Box 293 Mayo Memorial Building, 420 Delaware St., S.E., Minneapolis, MN 55455; 612/373-8012.

(October continued)

14-15 5th Adolescent Medicine & Health Conference; U of M: Earle Brown Center, U of M; CONTACT: CME, U of M, Box 293 Mayo Memorial Building, 420 Delaware Street, S.E., Minneapolis, MN 55455; 612/373-8012.

14-16 Midwest Allergy Forum; Minnesota Allergy Society, Hyatt Regency, Minneapolis; CONTACT: Dr. Paul Steinberg, 5000 W 39th Street, Minneapolis, MN 55416; 612/297-3091.

15 Annual Meeting of MN Chapter of American College of Physicians; Hyatt Regency, Minneapolis; CONTACT: Tom G. Bergstrom, M.D., 750 South Broadway, Cokato, MN 55321.

17-19 Recent Advances in Cardiac Catheterization; Mayo Clinic; Rochester; CONTACT: Postgraduate Courses, Mayo Clinic, 200 1st St. S.W., Rochester, MN 55905, 507/284-2085.

18 Antibiotic Update; Central Mesabi Medical Center; Central Mesabi Medical Center; CONTACT: Ben P. Owens, M.D., Mesaba Clinic, Hibbing, MN 55746; 218/262-3441.

19-21 Second Annual Course: Emergency Medicine for Primary Care Physicians; St. Paul-Ramsey Medical Center; St. Paul Hotel; CONTACT: Ruth McIntyre, St. Paul-Ramsey Medical Center, 650 Jackson Street, St. Paul, MN 55101; 612/221-3992.

20-22 17th Annual Orthopedic and Trauma Seminar; Hennepin County Medical Center; Hennepin County Medical Center — Pillsbury Auditorium; CONTACT: Ramon B. Gustilo, M.D., 701 Park Avenue South, HCMC Orthopedic Office 813, Minneapolis, MN 55415; 612/347-2812.

20-22 9th Annual Meeting — MN Chapter of the Great Plains Organization for Perinatal Health Care; MN Chapter — Great Plains Organization for Perinatal Health; Holiday Inn Downtown, Mankato; CONTACT: Kimberly Bardis, Regional Coordinator, Box 50, 420 Delaware Street, SE, Minneapolis, MN 55455; 612/373-5718.

21-22 Annual Meeting of MN Society of Neuro Sciences; Minneapolis; CONTACT: Lawrence Schut, M.D., 4225 Golden Valley Road, Minneapolis, MN 55422; 612/588-0661.

23 Update in Cardiology; Mayo Clinic; Rochester; CONTACT: Postgraduate Courses, Mayo Clinic, 200 1st Street S.W., Rochester, MN 55905; 507/284-2085.

24-26 Clinical Reviews; Mayo Clinic; Rochester; CONTACT: Postgraduate Courses, Mayo Clinic, 200 1st Street, S.W., Rochester, MN 55905; 507/284-2085.

27-28 Medical Management of Disability Claims; U of M; Radisson South, Bloomington; CONTACT: CME, U of M, Box 293, Mayo Memorial Building, 420 Delaware Street, S.E., Minneapolis, MN 55455; 612/373-8012.

November, 1983

3 John I. Coe Symposium — Computers in Anatomic Pathology and Newer Immunodiagnostic Techniques; U of M; Hennepin County Medical Center; CONTACT: John T. Crosson, M.D., 701 Park Avenue, Minneapolis, MN 55447; 612/347/3010

3-4 Society of Shoulder & Elbow Surgeons; Mayo Clinic, Rochester; Postgraduate Courses, Mayo Clinic, 200 1st Street S.W., Rochester, MN 55905; 507/284-2085.

4 Head & Neck Pathology — E. T. Bell Annual Pathology Symposium; U of M, Minneapolis; CONTACT: CME, U of M, Box 293 Mayo Memorial Building, 420 Delaware St. S.E., Minneapolis, MN 55455; 612/373-8012.

4 Semi-Annual Meeting, MN Surgical Society; Minneapolis, MN; CONTACT: Charles L. Barbee, M.D., 1000 E. 1st St., Ste. 203, Duluth, MN 55805; 218/727-7259.

5 Fall Seminar — Minnesota Society of Clinical Pathologists; Phillips Wangenstein, University of Minnesota; CONTACT: Eugenia Kassar, 2221 University Avenue, S.E., Suite 400, Minneapolis, MN 55414; 612/378-1875.

5 Minnesota Society of Anesthesiologists — Fall Meeting; L'hotel Sofitel, Minneapolis; CONTACT: David E. Byer, M.D., 200 1st Street S.W., Rochester, MN 55901.

6 ENT for Primary Care Physicians; Mayo Clinic Rochester; CONTACT: Postgraduate Courses, Mayo Clinic, 200 1st Street, S.W., Rochester, MN 55905 507/284-2085.

7 Problems in OB/GYN and Endocrinology; The Duluth Clinic; St. Mary's Hospital Auditorium; CONTACT: James Brueggemann, M.D., The Duluth Clinic, Ltd., 400 E. 3rd Street, Duluth, MN 55805; 218/722-8364.

7-9 Clinical Reviews; Mayo Clinic Rochester; CONTACT: Postgraduate Courses, Mayo Clinic, 200 1st Street, S.W., Rochester, MN 55905; 507/284-2085.

9-10 Behavioral Medicine; University of Minnesota; Mayo Memorial Auditorium, U of M; CONTACT: CME, U of M, Box 293 Mayo Memorial Building, 420 Delaware Street S.E., Minneapolis, MN 55455; 612/373-8012.

10-12 Clinical Strategies in Primary Care Medicine; St. Paul-Ramsey Medical Center & University of Minnesota Medical School; The Saint Paul Hotel; CONTACT: Ruth McIntyre, 640 Jackson Street, St. Paul, MN 55101; 612/221-3992.

11-12 4th Annual Seminar for CME Directors; Minnesota Medical Association; Spring Hill Center, Wayzata; CONTACT: Eugenia C. Kassar, Suite 400, 2221 University Avenue S.E., Minneapolis, MN 55414; 612/378-1875.

27-29 Coronary Heart Disease Workshop; University of Minnesota; Spring Hill Center, Wayzata; CONTACT: CME, University of Minnesota, Box 293 Mayo Memorial Building, 420 Delaware Street S.E., Minneapolis, MN 55455; 612/373-8012.

For further information on *future* CME programs, contact CME and Meeting Services, Minnesota Medical Association, 2221 University Ave. SE, Suite 400, Minneapolis, MN 55414, 612/378-1875.

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GENERAL SURGEON AND/OR OB/GYN SURGEON to join 10 doctor multi-specialty group in Owatonna, a community of 18,500 located 68 miles south of the Twin Cities and 42 west of Rochester. Present staff consists of 7 family practitioners, 2 internists, and 1 general surgeon. Other specialties in the community and a close working relationship with the Mayo Clinic, the University of Minnesota hospitals, and other metropolitan centers provide for excellent consultations. Guaranteed salary first year with incentive program thereafter. Group Health, disability, life and accident insurance, retirement profit sharing, and automobiles provided by corporation. Contact: J. D. Miller, M.D. or James Wilkus, Administrator, Owatonna Clinic, P.A., 134 Southview, Owatonna, MN 55060. Telephone (507) 451-1120.

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OB-GYN: "Do you wish to re-locate? Practice available in So. Minn. community!" Write: Minnesota Medicine, (737), 2221 University Ave. S.E., Minneapolis 55414.

FAMILY PRACTITIONER seeks group practice, rural or urban Minnesota. Board Certified, Minnesota trained, 2 years rural experience. Reply to John Wander, M.D., Star Route Box 10, Gerton North Carolina 28735.

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(Continued from page 585)

GENERAL SURGEON AND INTERNIST to join 8 family physicians and 2 internists. Recently remodeled and expanded clinic facility, 6 blocks from modern well-equipped 99 bed hospital, 45 minutes south of Minneapolis on 35W. First year salary guarantee, paid malpractice, life and disability insurance, vacation and study time.

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References: 1. Kales A et al: *J Clin Pharmacol* 17:207-213, Apr 1977 and data on file, Hoffmann-La Roche Inc., Nutley, NJ. 2. Kales A: Data on file, Hoffmann-La Roche Inc., Nutley, NJ. 3. Zimmerman AM: *Curr Ther Res* 13:18-22, Jan 1971. 4. Kales A et al: *JAMA* 241:1692-1695, Apr 20, 1979. 5. Kales A, Scharf MB, Kales JD: *Science* 201:1039-1041, Sep 15, 1978. 6. Kales A et al: *Clin Pharmacol Ther* 19:576-583, May 1976. 7. Kales A, Kales JD: *Pharmacol Physicians* 4:1-6, Sep 1970. 8. Frost JD Jr, DeLucchi MR: *J Am Geriatr Soc* 27:541-546, Dec 1979. 9. Dement WC et al: *Behav Med* 5:25-31, Oct 1978. 10. Vogel GW: Data on file, Hoffmann-La Roche Inc., Nutley, NJ. 11. Karacan I, Williams RL, Smith JR: The

sleep laboratory in the investigation of sleep and sleep disturbances. Scientific exhibit at the 124th annual meeting of the American Psychiatric Association, Washington, DC, May 3-7, 1971. 12. Pollak CP, McGregor PA, Weitzman ED: The effects of flurazepam on daytime sleep after acute sleep-wake cycle reversal. Presented at the 15th annual meeting of the Association for Psychophysiological Study of Sleep, Edinburgh, Scotland, June 30-July 4, 1975. 13. Data on file, Hoffmann-La Roche Inc., Nutley, NJ.

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An added complication... in the treatment of bacterial bronchitis*

Increasing incidence
of ampicillin resistance in
Haemophilus influenzae

Ampicillin Resistant
Haemophilus influenzae

H. influenzae

S. pneumoniae

Brief Summary. Consult the package literature for prescribing information.

Indications and Usage. Cefaclor* (cefaclor, Lilly) is indicated in the treatment of the following infections when caused by susceptible strains of the designated microorganisms:

Lower respiratory infections, including pneumonia caused by *Streptococcus pneumoniae* (*Diplococcus pneumoniae*), *Haemophilus influenzae*, and *S. pyogenes* (group A beta-hemolytic streptococcus).

Appropriate culture and susceptibility studies should be performed to determine susceptibility of the causative organism to Cefaclor.

Contraindication: Cefaclor is contraindicated in patients with known allergy to the cephalosporin group of antibiotics.

Warnings: IN PENICILLIN-SENSITIVE PATIENTS, CEPHALOSPORIN ANTIBIOTICS SHOULD BE ADMINISTERED CAUTIOUSLY THERE IS CLINICAL AND LABORATORY EVIDENCE OF PARTIAL CROSS-ALLERGENICITY OF THE PENICILLINS AND THE CEPHALOSPORINS, AND THERE ARE INSTANCES IN WHICH PATIENTS HAVE HAD REACTIONS, INCLUDING ANAPHYLAXIS, TO BOTH DRUG CLASSES.

Antibiotics, including Cefaclor, should be administered cautiously to any patient who has demonstrated some form of allergy, particularly to drugs.

Pseudomembranous colitis has been reported with virtually all broad-spectrum antibiotics (including macrolides, semisynthetic penicillins, and cephalosporins); therefore, it is important to consider its diagnosis in patients who develop diarrhea in association with the use of antibiotics. Such colitis may range in severity from mild to life-threatening.

Treatment with broad-spectrum antibiotics alters the normal flora of the colon and may permit overgrowth of clostridia. Studies indicate that a toxin produced by *Clostridium difficile* is one primary cause of antibiotic-associated colitis.

Mild cases of pseudomembranous colitis usually respond to drug discontinuance alone. In moderate to severe cases, management should include sigmoidoscopy, appropriate bacteriologic studies, and fluid, electrolyte, and protein supplementation. When the colitis does not improve after the drug has been discontinued, or when it is severe, oral vancomycin is the drug of choice for antibiotic-associated pseudomembranous colitis produced by *C. difficile*. Other causes of colitis should be ruled out.

Precautions: General Precautions—If an allergic reaction to Cefaclor occurs, the drug should be discontinued, and, if necessary, the patient should be treated with appropriate agents, e.g., pressor amines, antihistamines, or corticosteroids.

Prolonged use of Cefaclor may result in the overgrowth of nonsusceptible organisms. Careful observation of the patient is essential. If superinfection occurs during therapy, appropriate measures should be taken.

Positive direct Coombs' tests have been reported during treatment with the cephalosporin antibiotics. In hematologic studies or in transfusion cross-matching procedures when antiglobulin tests are performed on the minor side or in Coombs' testing of newborns whose mothers have received cephalosporin antibiotics before parturition, it should be recognized that a positive Coombs' test may be due to the drug.

Cefaclor should be administered with caution in the presence of markedly impaired renal function. Under such conditions, careful clinical observation and laboratory studies should be made because safe dosage may be lower than that usually recommended.

As a result of administration of Cefaclor, a false positive reaction for glucose in the urine may occur. This has been observed with Benedict's and Fehling's solutions and also with Clintest* tablets but not with Tes-Tape* (Glucose Enzymatic Test Strip, USP, Lilly).

Broad-spectrum antibiotics should be prescribed with caution in individuals with a history of gastrointestinal disease, particularly colitis.

Usage in Pregnancy—Pregnancy Category B—Reproduction studies have been performed in mice and rats at doses up to 12 times the human dose and in ferrets given three times the maximum human dose and have revealed no evidence of impaired fertility or harm to the fetus due to Cefaclor. There are, however, no adequate and well-controlled studies in pregnant women. Because animal reproduction studies are not always predictive of human response, this drug should be used during pregnancy only if clearly needed.

Nursing Mothers—Small amounts of Cefaclor have been detected in mother's milk following administration of single 500-mg doses. Average levels were 0.18, 0.20, 0.21, and 0.16 mcg/ml at two, three, four, and five hours respectively. Trace amounts were detected at one

Some ampicillin-resistant strains of *Haemophilus influenzae*—a recognized complication of bacterial bronchitis*—are sensitive to treatment with Cefaclor.¹⁻⁶

In clinical trials, patients with bacterial bronchitis due to susceptible strains of *Streptococcus pneumoniae*, *H. influenzae*, *S. pyogenes* (group A beta-hemolytic streptococci), or multiple organisms achieved a satisfactory clinical response with Cefaclor.⁷

Cefaclor®

cefaclor

Pulvules®, 250 and 500 mg

hour. The effect on nursing infants is not known. Caution should be exercised when Cefaclor* (cefaclor, Lilly) is administered to a nursing woman.

Usage in Children—Safety and effectiveness of this product for use in infants less than one month of age have not been established.

Adverse Reactions: Adverse effects considered related to therapy with Cefaclor are uncommon and are listed below.

Gastrointestinal symptoms occur in about 2.5 percent of patients and include diarrhea (1 in 70).

Symptoms of pseudomembranous colitis may appear either during or after antibiotic treatment. Nausea and vomiting have been reported rarely.

Hypersensitivity reactions have been reported in about 1.5 percent of patients and include morbilliform eruptions (1 in 100). Pruritus, urticaria, and positive Coombs' tests each occur in less than 1 in 200 patients. Cases of serum sickness-like reactions (erythema multiforme or the above skin manifestations accompanied by arthritis/arthritis and, frequently, fever) have been reported. These reactions are apparently due to hypersensitivity and have usually occurred during or following a second course of therapy with Cefaclor. Such reactions have been reported more frequently in children than in adults. Signs and symptoms usually occur a few days after initiation of therapy and subside within a few days after cessation of therapy. No serious sequelae have been reported. Antihistamines and corticosteroids appear to enhance resolution of the syndrome. Cases of anaphylaxis have been reported, half of which have occurred in patients with a history of penicillin allergy.

Other effects considered related to therapy included eosinophilia (1 in 50 patients) and genital pruritus or vaginitis (less than 1 in 100 patients).

Causal Relationship Uncertain—Transitory abnormalities in clinical laboratory test results have been reported. Although they were of uncertain etiology, they are listed below to serve as alerting information for the physician.

Hepatic—Slight elevations of SGOT, SGPT, or alkaline phosphatase values (1 in 40).

Hematopoietic—Transient fluctuations in leukocyte count, predominantly lymphocytosis occurring in infants and young children (1 in 40).

Renal—Slight elevations in BUN or serum creatinine (less than 1 in 500) or abnormal urinalysis (less than 1 in 200).

[061782F]

*Many authorities attribute acute infectious exacerbation of chronic bronchitis to either *S. pneumoniae* or *H. influenzae*.

Note: Cefaclor is contraindicated in patients with known allergy to the cephalosporins and should be given cautiously to penicillin-allergic patients.

Penicillin is the usual drug of choice in the treatment and prevention of streptococcal infections, including the prophylaxis of rheumatic fever. See prescribing information.

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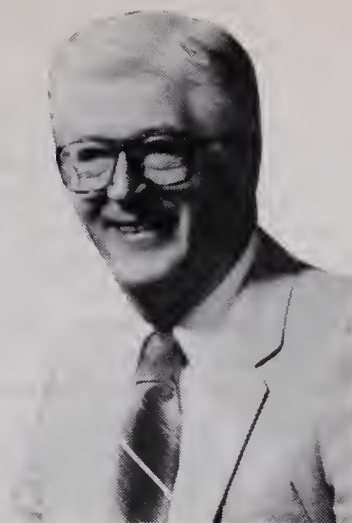
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President's Letter



Economic Pressures and Ralph

In my September Letter*, I made the point that in my judgment medical care is a service whose quality as it relates to the environment in which it functions is best conceived of in terms of dynamic forces with which the patient, the environment, and the physician interact over a period of time for the purpose of prolonging life, improving health and reducing symptoms. The foundation of this service consists of the knowledge and technology which is applied to the biologic problem that an individual patient presents to the physician.

Examples of dynamics influencing the quality of this service holds that various forces impacting on patient or physician behavior will affect the results in a predictable manner. Envisionments of fear, mutual distrust, exorbitant economic pressures, fragmentation of services, etc. will have detrimental effects. As in the case with other dynamic systems, the stronger the force impacting on the elements of the system, the greater will be the effect.

Those of us whose training took place prior to the past ten years came out of our training with the concept that the more careful we were, the more possible causes of any given condition we could think of, the more treatment modalities we were knowledgeable about, and the more of this knowledge that we applied to the patient's problem, the better job we were doing.

In the last 15 years or so, this equating of thoroughness with quality has been re-enforced by plaintiff attorneys who delight in attempting to make a clinician appear incompetent by searching for tests or treatments which were not done. Thus, the concept of defensive medicine arose, and there developed implications that thoroughness was pure and simple self-defense on the part of the doctor and the product

of legal pressures. Those of us who antedate the mal-practice craze know better of course. Thoroughness is deeply ingrained in any physician who seeks a high level of quality in his practice.

The public as individuals also equate thoroughness with quality. Any physician who has practiced for many years knows the force of the anger that is directed toward him/her as a result of perceived lack of thoroughness by patients or relatives, if expected results are not achieved. He/she also knows the anger with which many people meet suggestions by the doctor to reduce intensity of efforts to help the patient in order to reduce expenses.

Let us consider the dynamics of economic pressure on physicians to abandon thoroughness in the practice of medicine (or in the words of Senator Durenberger, to alter physician behavior). The only conceivable alteration would be for the physician to be less thorough though the Senator does not go on to be that specific. The following are likely to result from severe economic pressure on physicians: (No prioritizing is intended.)

- Minimize the difference between the clinician who maintains an active interest in expanding and retaining knowledge of clinical medicine and the clinician who is satisfied with the simplest explanation of clinical events and the simplest mode of therapy. Unused knowledge quickly atrophies.
- Decrease the frequency of diagnosis of uncommon medical conditions by decreasing testing for them.
- Decrease the safety of management of chronic disease by minimizing testing of drug levels, or testing for signs of drug toxicity.
- Decrease the effectiveness of the management of chronic diseases by reducing frequency of tests to judge effectiveness of therapy.
- Reduce the quality of treatment by avoiding use of new drugs and tests which tend to be more ex-

*Page 533.

PRESIDENT'S LETTER

pensive than older modalities (what degree of economic pressure, for example, would force a clinician to abandon use of transdermal nitroglycerin for the much cheaper but less effective sublingual form as baseline treatment for progressive angina pectoris).

- Force physicians to be less vigorous in the treatment of an acute illness in older patients. An example is the fact that in Norway, no citizen over 65 is allowed to have coronary revascularization surgery. This is a decision based on economic factors.
- Reduce the number of consultations which therefore reduces the scope and quality of judgment in decision making on the patient's behalf.
- Create rationing of medical care. We have this now for welfare patients who are refused the use of many medications by regulation based on economic factors.
- Reverse the present policy of having broadly educated medical specialists in favor of narrow-based specialty training of people without general medical education. This appeals to many planners as a cost-saving step, though many of us believe that once licensed, these technicians will actually increase costs while they further the fragmentation of care.
- Force physicians and clinics to expend more money on commercial self promotions while they abandon the care of low paying, high cost disease states.

Let us abandon the abstract before leaving the subject of quality. Let us consider Ralph, age 56. Ralph was a big man, perhaps 6' 3" tall, weight 250 pounds. He was for all his imposing size a sensitive and expressive person who felt deeply about many things. Now and then his feelings about his family or his church would cause him to choke as he spoke, much to his embarrassment. He was at the stage of life at which three decades of effort and dedication were bearing fruit with a successful business career, several outside activities, and his beloved church and family, all forming important parts of his life. He was excited about a proposed trip to Norway to take place in just a few months. For Ralph, life was sweet and to protect his health he reported for an examination, mainly concerned about a moderate degree of hypertension which he wanted checked. He had no significant discomforts or signs of illness.

Now I found myself pausing outside of his examination room door knowing that as soon as I opened that door, Ralph's life would never be the same again. I had just looked at his chest x-ray and had seen a large lesion in the right upper lobe of his lung, which proved to be lung cancer. The only part of Ralph's life that was not rational and positive was that he was addicted to smoking — two packs of cigarettes a day.

There followed the usual stupefied emotional shock and inability to really comprehend the full implication of what he was being told. All the complex fabric of his life was suddenly ripped apart as the totally unexpected bad news confronted him. As I worked through this difficult experience with Ralph (he died of unrelated causes about a year later), I yet again pondered the incongruities we face in our profession.

If either I or Ralph had been under intensive economic pressure to cut costs, I would have not taken the chest x-ray that gave Ralph his chance for survival. (At autopsy there was one small malignant node, remaining partially necrotic from chemotherapy.) For Ralph this would not have constituted "high quality care at a more reasonable cost" *it would instead have been low quality care at a lower cost.* There is a seemingly insoluble conflict between high quality medical care which demands consideration of low frequency conditions and other manifestations of thoroughness and economic pressures which demand that such considerations be minimized or stopped.

Our country's Declaration of Independence lists the pursuit of happiness as an inalienable right. We Americans have taken this very seriously and have elaborated history's most luxurious and expensive systems of entertainment, law, funerals, etc. Along with this we devised a medical care system which seeks to make available the entire spectrum of technology to each person's health needs. It is very noteworthy that of all these systems, the medical care system is *the* one we are now bent on changing, despite the fact that it is *highly effective* and one of *our largest employers*. It is indeed a growth industry.

Any other industry currently showing similar growth would be regarded as a beacon shining in the recent darkness of recession.

The day before he came to see me, Ralph probably would have agreed with the viewpoint that medical care costs are too high and that restrictions should be devised. At the point of his own need, however, he wanted the full use of all available help, just as is the case with each one of us.

It is our privilege to work in a medical care system that promotes the availability to help at the point of each person's needs. *It is worth any struggle to help maintain it that way.*



Donald C. Bell, M.D.
President
Minnesota Medical Association



Editor's Notebook

The Editor Interviews a Business Buzzword Consultant

Editor: In the next three issues of MINNESOTA MEDICINE, I shall write editorials on the "Business of Medicine". Those issues will carry articles on various aspects of competitive medicine. To prepare readers for those editorials and articles, I have invited you as a *consultant* to acquaint readers with business language. Why don't you start by telling us what a *consultant* is?

Consultant: A *consultant* is the working title for someone who is currently between jobs. As a *consultant*, I help people like you resolve conflicting evidence to make decisions. In medical language, you might say I am an *ambivalence chaser*.

Editor: How does a *consultant* do what he does?

Consultant: How? Well, I tell clients how to improve the *bottom line*, what the end result is, what it's all about, the long and short of it, the truth in this valley of fog, mist, and tears. I turn your business *insight* out.

Editor: How do you do that?

Consultant: By giving you the *big concept*.

Editor: What is the *big concept*?

Consultant: Anything you pay an *outside consultant* more than \$25,000 for. *Consultants* who deal with the small concepts — demand, supply, capital, and elasticity — are marginal thinkers.

Editor: Come now. There must be more to *consulting* than *money*?

Consultant: Maybe so. Anyway, to err is humor, but to forget the *bottom line* is inexcusable.

Editor: You businessmen reduce everything to money. Your answers illustrate what we physicians worry about — that advocates of competitive medicine focus more on the *bottom line* than on *quality medicine*. You seem more interested in *checks appeal* than caring for the patient.

Consultant: Nonsense. As a businessman physician, you always practice *quality medicine* yourself. It's *the competition* who cuts fees irrationally, who practices a shoddy brand of medicine, and who makes twice as much as you do. Come to think of it, if *the competition* ever asks you to join their group, leap at it.

Editor: I don't understand. How do you cut fees and maintain quality?

Consultant: You don't do it with mirrors. You do it with *management*.

Editor: What do you mean by *management*?

EDITOR'S NOTEBOOK

Consultant: I mean getting *other people* to do the work with OPM — *other people's money*.

Editor: But that sounds like you are using *other people's* talent, skills, and money for your own *profit*.

Consultant: Exactly. *profit* is the *name of the game*. We call this approach the *mushroom theory of management*. You keep employees in the dark, force feed them high quality manure, and when they're mature enough to see the light, you can them.

Editor: But how can you practice that theory with a well-defined *organizational structure*.

Consultant: Why not? An *organizational structure* is nothing but a delicately tuned system of checks, balances, procedures, and committees designed to restrain people with crazy ideas — especially ideas crazy enough to work.

Editor: Suppose businessmen take over medicine. Won't they advise doctors to resort to *advertising* to survive?

Consultant: Please. *marketing*, not *advertising*.

Editor: What's the difference?

Consultant: *Advertising* is persuading patients to pay a higher price so you can receive more money to support more *advertising*. *Marketing* is *advertising* by someone with a college education.

Editor: Won't doctors need *capital* to support their *organizational structures* and *marketing* activities?

Consultant: Gee, you're catching on fast. Now all you have to do is learn the language of money to acquire *capital*. *Banking*, for example, is nothing more or less than *organized prime*. *Bankruptcy* is, or course, *life after debt*. A *capital gains tax* is an *accrual and unusual form of punishment*. *Cash*, for your information, is an *obsolete form of money* acceptable only with a driver's licence and two forms of identification. And a *banker* is a person who is willing to loan you money provided you can prove you don't need the money. Old *bankers* never die, they just lose their *interest*.

Editor: Are you through with the punny business?

Consultant: No, *savings* are a *cents-less* way to save; *income taxes* are the *hauls of Congress*; and a *recession* is a *lapse of luxury*.

Editor: As a punster, don't you ever suffer from writer's block?

Consultant: A true practitioner of *cornography* never has *bankruptcy*.

Editor: Enough nonsense. Let's apply *business principles* to the *real world*. From 1970 to 1980, the number of U.S. physicians rose from 311,000 to 436,000. This number will grow to 666,000 by 1990. How will these numbers effect the *law of supply and demand*?

Consultant: First of all, when someone says it's the *principle* and not the *money*, it's the money. Secondly, *the law of supply and demand* states that when supply exceeds demand, prices fall. When demand exceeds supply, prices rise. This works in all sectors of the American economy except for agriculture (where government props up prices), industry (where prices rise when production is falling), labor (where wages rise despite heavy unemployment), international trade (where domestic prices are protected by tariffs and voluntary restraints), and medicine (where government increases the demands of patients, stimulates the supply of doctors, and then fixes the prices).

EDITOR'S NOTEBOOK

Editor: How will DRGs affect the *invisible hand of the market*.

Consultant: Beats me. But I know DRGs stand for *Drastic Reduction of Givens* or *Deluge of Regulatory Garbage*, depending on your point of view. DRGs will force doctors to play the *zero sum game*, whereby every competitor's gain is another competitor's loss. In other words, the health care system is no longer an expandable balloon but a fixed piece of pie. You won't be able to have your cake and eat it too. Speaking of balloons, pies, and cakes reminds me of my first girl friend: her hair cascaded over her apple-smooth shoulders when I *metaphor* the first time. You see, as a *consultant*, I mix my metaphors to keep my clients off-balance.

Editor: Be serious. Tell me, no matter what the payment scheme, prospective or retrospective, won't doctor groups and hospitals save themselves through *mergers*, *acquisitions*, and *consolidations*?

Consultant: You've got to be kidding. *mergers* and *acquisitions* are nothing but *Pac-Man for Big Boys*. And *consolidation* is a businessman's euphemism, which, roughly translated, means: "*Attention all rats, don your life jackets.*"

Editor: It can't be that bad. *innovative entrepreneurs* will save us.

Consultant: Don't count on it. An *innovative entrepreneur* is a high-roller who would rather be a *spectacular failure* than a *dismal success*.

Editor: Come now. I'm confident physicians and businessmen will achieve *synergy* and attract *Venture Capital*.

Consultant: You mean *vulture capital*, don't you? Besides *synergy* is *voodoo economics*. It violates all rules of fiscal common sense. It says one and one make three, and *two lemons* (e.g. two failing hospitals) *make lemonade*.

Editor: OK, suppose you're right. What *scenario* do you foresee?

Consultant: A *scenario*, as you know, is a business decision set in context, and it comes in sets of three: *best case*, *worst case*, and *just in case*. I've been giving you the worst case — the *doomsday scenario*.

Editor: Just in case readers want to know what this interview is all about, read the next three issues of MINNESOTA MEDICINE.

Consultant: You doctors are all alike — full of *M.D.-promises*.



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Cervical Cerclage

20 Years' Experience at the Mayo Clinic

JAVIER F. MAGRINA, M.D.*; ROGER D. KEMPERS, M.D.†; and TIFFANY J. WILLIAMS, M.D.‡

During a recent 20-year period, 36 cerclage procedures were performed on gravid women. Size of cervical dilatation rather than gestational age at the time of cerclage was related to the outcome of the cerclage. Patients with dilatation at 3 cm or less had a much higher success rate than did patients with dilatation of 4 cm or more. The success rate did not differ in relation to the time of gestation or the performance of cerclage.

CERVICAL INCOMPETENCE is descriptive of a clinical condition characterized by progressive, painless dilatation of the cervix, usually during the midtrimester of pregnancy, with final passage of the products of conception without prominent uterine contractions. Little is known about the cause of this condition. Because of variations in the criteria for the diagnosis of cervical incompetence and for the evaluation of therapeutic results, it is difficult to establish precise comparisons among different reported series. However, better results have been obtained with prophylactic than with emergency cerclage for cervical incompetence.¹⁻³

Our Series

The records of all patients treated for cervical incompetence at the Mayo Clinic during the 20-year period Jan. 1, 1956, through Dec. 31, 1975, were evaluated. A total of 109 patients underwent cervical cerclage, trachelorrhaphy, or other corrective cervical surgery such as repair of cervical lacerations. Forty-four cervical cerclage procedures were performed: 36 on pregnant patients and eight on nonpregnant patients.

The records of the patients who underwent cerclage were studied for possible etiologic factors and diagnostic methods. Age, race, parity, size of cervical dilatation, and length of gestation at the time of cerclage were tabulated. The operative complications, prophylactic medical treatment, length of hospital

stay, length of gestation at the time of suture removal, time interval between cerclage and suture removal and between cerclage and delivery, and outcome of pregnancy were evaluated.

The cerclage procedures were grouped as either prophylactic or emergency. The size of cervical dilatation, gestational age at the time of the procedure, and the outcome of pregnancy were compared.

Thirty-six cerclage procedures were performed on 28 gravid women. Two patients had three such operations, each for different pregnancies, and four patients had two cerclages, three for different pregnancies. For ease of presentation, the results will be reported in terms of 36 patients since each cerclage was a separate procedure at a different time, even though the same patient was involved more than one time. There were 15 cerclage operations performed on 15 patients on an emergency basis. These were women who had histories suggestive of cervical incompetence and who presented with significant cervical dilatation during pregnancy; most of these patients were asymptomatic. Twenty-one cerclage procedures were performed "prophylactically" on 17 patients with histories of cervical incompetence who were followed up with repeated pelvic examinations during the pregnancy. In these patients, the need for cerclage had been anticipated from the beginning of pregnancy.

In addition, eight nonpregnant patients were treated by cerclage, all on a prophylactic basis.

Findings

The ages of the 36 patients ranged between 18 and 44 years, with a mean of 31 years; all were Caucasian. Each of the 28 gravid patients making up this study had been pregnant at least once before the cerclage.

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Nineteen (68%) of the 28 patients had a previous delivery beyond 20 weeks of gestation. Nine patients (32%) had a previous curettage; one patient had had a cervical conization one year before the cerclage, and another patient had an old 2-cm obstetrical laceration in the posterior cervical lip.

The diagnosis of cervical incompetence was established on the basis of the past obstetrical history. Thirteen patients had had two or more abortions or premature deliveries (or both). Ten patients had the diagnosis made on the basis of a history of one abortion or premature delivery and a previous cervical cerclage (or both). Eleven other patients who gave histories of a previous abortion or premature delivery had diagnoses of cervical incompetence made on the basis of findings during repeated interval pelvic examinations after the beginning of the pregnancy. In one patient, the diagnosis was established by hysterosalpingography and in another, on the basis of the examiner's ability to pass a no. 8 Hegar dilator through the endocervical canal without pressure or discomfort.

Cervical dilatation at operation was 3 cm or less in 25 patients and 4 to 7 cm in 11 patients. The mean cervical dilation at surgery was 2.5 cm, being 1.1 cm for patients with prophylactic cerclage and 4.5 cm for patients with emergency cerclage.

In four patients, the cerclage was performed during the first trimester of pregnancy; in 27, during the second trimester; and in five, during the third trimester.

The mean gestational age at the time of suture insertion was 21.1 weeks (range 10 to 30 weeks), being 17.6 weeks (range eight to 30 weeks) for patients with prophylactic cerclage and 23.2 weeks (range 15 to 29 weeks) for those with emergency cerclage.

Twenty-five of the patients were asymptomatic at the time of diagnosis and treatment. Five patients complained of mild uterine contractions and three of vaginal pressure. Two patients presented with profuse vaginal discharge and one with vaginal bleeding.

Prophylactic medical treatment (progestational agents or narcotics or both) was employed in 29 of the 36 patients (81%). Seven patients (19%) received no prophylactic treatment. Phenytoin and morphine sulfate, alone or in combination, were the most frequently employed drugs, having been used in 22 and 16 patients, respectively. These medications were used in 19 (90%) of the 21 patients with prophylactic cerclage and in 11 (73%) of the 15 patients with emergency cerclage.

Thirty-five of the 36 cerclages were done with the Shirodkar technique.⁴ The suture material used was a Mersilene band (5 mm), as recommended by Barter and associates⁵, in 33 cases and Teflon mesh (1 cm strip) in 2. In one case, the McDonald technique³ using black silk (no. 2) was done. In four patients who presented with complete cervical effacement (6 or 7 cm of cervical dilatation) and bulging amniotic sac, the membranes ruptured during the attempt to place the suture in the cervix, and these were classified as failed cerclage. All four were in the emergency group. The average hospital stay was 4.8 days (range 4 to 11 days). There was no post-operative morbidity, although one patient remained hospitalized for 11 days with a presumptive diagnosis of phlebitis.

Onset of labor occurred postoperatively in 7 of the 36 patients (19%). Five of the seven had the cerclage performed on an emergency basis, and two other procedures were performed prophylactically. Three of the seven were having mild contractions before the cerclage procedure, and all of them aborted in spite of medical treatment. The labor was stopped in two other patients, one by the use of repeated doses of morphine and the other with intravenously administered ethanol. Another patient aborted in spite of medical treatment, and no attempt to stop labor was made in another patient in whom bulging membranes and 4 cm of dilatation developed shortly after the cerclage.

The average gestational age at the time of suture removal was 35 weeks (range 18 to 41 weeks). The suture was removed before vaginal delivery in 24 (67%) of the 36 patients. Of these, 13 (54%) were in active labor, eight (33%) were at 38 to 40 weeks of gestation, one had experienced amnionitis-endometritis, and two had the suture slip from the cervix. In eight (22%) of the 36 patients, the suture was removed after delivery. This was done in three after vaginal delivery and in five after cesarean section. The three patients who had vaginal delivery had been hospitalized while in active labor with advanced cervical dilatation. In two of these, the suture had pulled through the posterior cervical lip, and in the remaining patient, it had broken spontaneously.

The average hospital stay for all 36 patients was 4.8 days. This is in agreement with previously reported figures⁶; however, Barter and associates⁵ reported a prolonged hospital stay in their series of patients without an improvement in the success rate.

In approximately half of the patients, the suture was removed after labor had begun, and in about

one-third, removal was done between 38 and 40 weeks of gestation. In one previous report¹, 65% of the patients had the suture removed during labor, and as was also noted in the present series, this caused no complications.

The average duration of cervical cerclage was 14.8 weeks, which is similar to the 14.4 weeks noted by Barter and associates⁵. This interval was shorter for patients with emergency cerclage (6.6 weeks) than for patients with prophylactic cerclage (18.3 weeks); however, this is probably of no significance because the mean number of gestational weeks at the time of emergency cerclage was higher (23.2 weeks) than that at prophylactic cerclage (17.6 weeks).

The average gestational age at the time of delivery was 36.6 weeks (range 18 to 41 weeks). Delivery occurred vaginally in 31 cases (86%) and by cesarean section in five (14%).

The mean time interval between suture removal and delivery was markedly shortened for patients who were in labor when the suture was removed, this being 6.1 hours as compared with 8.8 days for those who were not in labor (Table 1).

TABLE 1

Interval Times After Cerclage in 36 Gravid Patients

Interval	Mean	Time
		Range
Cerclage to suture removal	14.3 wk*	4 h to 30 wk
Suture removal to delivery	8 days†	19 min to 6 wk
Cerclage to delivery	14.7 wk	9 h to 30 wk

*Emergency group, 6.6 wk; 18.3 wk for prophylactic group.

†Group in labor, 6.1 h; 8.8 days for nonlabor group.

When the pregnancy with cerclage and the subsequent delivery resulted in a living fetus, the operation was considered as being successful. The outcomes, including prematurity and abortion rates, before and after prophylactic and emergency cerclages and for all patients in this study are listed in Table 2.

Successful cerclage was more frequent when per-

formed prophylactically than when performed on an emergency basis ($P < 0.05$). Cervical dilatation correlated with fetal survival after cerclage (Table 3). Patients with dilatation of 3 cm or less had a much higher success rate than did patients with dilatation of 4 cm or more (Table 4). Gestational age was not correlated with result of cerclage. The success rate was slightly lower for patients who had the cerclage during the second trimester of pregnancy (Table 4).

TABLE 3

Comparison Between Successful and Unsuccessful Cerclage

Cerclage	No. of patients	Mean cervical dilatation (cm)	Mean gestation (wk)
Prophylactic			
Successful	19	1.5	17.6
Unsuccessful	2*	1.2	17.6
Emergency			
Successful	7	3.0	24.8
Unsuccessful	8	5.7†	22.2
Total			
Successful	26	2.1	21.5
Unsuccessful	10	4.8	20.8

*Too few for statistical analysis.

†Significantly different from successful group ($P < 0.001$).

TABLE 4

Relationship of Cervical Dilatation and Gestational Age at Cerclage to Fetal Outcome

	Patients	Living children	Success rate (%)
Cervical dilatation (cm)			
0-3	25	23	93
4-7	11	3	27
Gestation (wk)			
≤ 13	4	4	100
14-26	27	18	67
≥ 27	5	5	100

Patients who received prophylactic progesterational or narcotic agents (or both) had a higher success rate (77%) than did patients who had not (29%). In order to evaluate whether outcome of cerclage was influenced by prophylactic treatment, the number of successful and unsuccessful cerclages of patients with

TABLE 2
Fetal Outcome after Cerclage

Cerclage	Patients	Pregnancies	Living children		Premature		Abortions	
			No.	%	No.	%	No.	%
Prophylactic								
Before	17	40	13	33	8	20	19	48
After	17	21	18	86	1	5	1	5
Emergency								
Before	15	31	13	42	7	23	11	35
After	15	15	8	53	7	47	6	40
Total*								
Before	32	71	26	37	15	21	30	42
After	32	36	26	72	8	22	7	19

*Does not include four patients with failed cerclage.

cervical dilatation of 3 cm or less and of patients with cervical dilatation of 4 cm or more at cerclage was studied in relation to the administration of prophylactic treatment. In the patients with cervical dilatation of 3 cm or less, the number of patients who did not receive prophylactic therapy was too small to allow statistical analysis, but in the group with dilatation of 4 cm or more, there was a statistically significant difference ($P < 0.001$) between patients who received prophylactic treatment and those who did not, a successful cerclage being most frequent when treatment was prophylactic.

Eight patients had cerclage performed while in the nonpregnant state. These women had had a total of 27 pregnancies and had only four living infants (15% success). There were no subsequent pregnancies after cerclage in two patients. Only four had living children (one each); there were three abortions and three ectopic pregnancies among the six who remained fertile. Although these numbers are small, the success rate was only 50%, the rate of subsequent sterility was 25%, and the fetal wastage rate was 38%.

Discussion

Cervical incompetence is a condition infrequently encountered in obstetrical practice. During the period of this study, there were 28,091 deliveries and the incidence of cervical incompetence was one in 780 deliveries. Previously reported incidences^{1,2,5} have varied from one in 267 deliveries to one in 1,842.

Various etiologic factors, the principal one being traumatic, have been implicated as causative of cervical incompetence.^{2,5} No significant etiologic factor

has been identified in our series of patients.

Medical treatment for postoperative labor was used in six patients; it was effective in two of four patients who were asymptomatic before operation. Three patients aborted in spite of medical treatment, and in one, no attempt was made to stop labor. Attempts to arrest postoperative labor were limited to repeated doses of morphine or intravenously administered ethanol, because currently used newer regimens were not available. The use of β_2 -adrenergic receptor stimulants such as terbutaline and ritodrine to inhibit myometrial contractions might have been preferred and warranted in selected cases.

Patients with prophylactic cerclage had a success rate of 86% as compared with 53% for patients with emergency cerclage. There was a statistically significant difference between both groups of patients for outcome of cerclage; this difference could be explained on the basis of cervical dilatation at the time of cerclage.

In summary, we have not been able to identify a specific etiologic or causative factor in our patients with cervical incompetence. Size of cervical dilatation, rather than gestational age, at the time of cerclage was related to the outcome of the cerclage. Preoperative contractions have been associated with a poor outcome of cerclage. Operative difficulties and complications have been related to unsuitable cervical conditions at the time of cerclage. Prophylactic therapy with progestational or narcotic (or both) agents has been effective for patients with dilatation of 4 cm or more at the time of cerclage.

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National Football Fatality Report¹

Although fatalities reached an all-time high of 2.5 per 100,000 participants for 1968 to an all time low in 1979 of .23 per 100,000 participants, there has been a slight increase which may be disturbing in 1983. Brain injuries constituted the chief cause of fatalities (6 out of the 7 deaths reported due to brain injuries).

In football in 1983, 5 deaths were reported as a direct result of participation in a football game and 2 were reported as a result of squad scrimmages.

Some suggestions from the State High School Athletic League which may reduce fatal injuries are:

1. Proper execution in the fundamentals of football skills, particularly blocking and tackling should be stressed.
2. Emphasize the proper conditioning exercises to strengthen athletes' necks so participants will hold their heads firmly erect when making contact.
3. Coaches and officials must enforce prohibiting spearing, butt blocking and face tackling in practice and games. Players should be taught to respect the helmet as a protective device, and that the helmet should not be used as a weapon.
4. Equipment, particularly headgear, should be properly fitted. Coaches, physicians and trainers should take special care to see that this is done. Old and worn equipment, especially headgear, should be renovated or discarded.
5. A comprehensive physical examination as set by each state high school association should be required. (Every 3 years.)
6. Each school should strive to have a team trainer who is a regular member of the faculty and adequately qualified in treating and preventing injuries.
7. Maintain a close cooperation with manufacturers in the research of safety factors for athletic equipment.
8. Maintain a close cooperation with the medical groups at the national, state and community levels.

It is obvious from the following tables that tackling and being tackled are the most life threatening activities in football.

TYPE OF PLAY:	1982	1981	1980	1979	1978	1977
Tackling	3-42.9%	4-80.0%	3-33.3%	1-33.3%	5-55.5%	5-55.5%
Being Tackled	3-42.9%	0-0	4-44.4%	1-33.3%	1-11.1%	2-22.2%
Blocking	0-0	0-0	1-11.1%	0-0	0-0	0-0
Being Blocked	0-0	0-0	0-0	0-0	1-11.1%	0-0
Unknown	1-14.2%	1-20.0%	1-11.1%	1-33.3%	2-22.3%	1-11.1%
TYPE OF INJURY:	1982	1981	1980	1979	1978	1977
Brain Injury	6-85.8%	4-80.0%	7-77.7%	2-66.6%	3-33.3%	3-33.3%
Fractured Neck	0-0	1-20.0%	2-22.2%	1-33.3%	3-33.3%	3-33.3%
Ruptured Intestine	0-0	0-0	0-0	0-0	1-11.1%	1-11.1%
Heart and Chest	1-14.2%	0-0	0-0	0-0	1-11.1%	1-11.1%
FATALITIES:	1982	1981	1980	1979	1978	1977
Direct	7	5	9	3	9	8
Indirect	7	6	4	8	8	6
	14	11	13	11	17	14

In the November issue of MINNESOTA MEDICINE will be a report of the national football knee injury studies.

Resource Group on Sports Medicine
John W. Benton, M.D.
Chairman

Reference

1. National Federation of State High School Associations' Report February 1983.

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Abdominal Localization of Indium-111 Labeled Leukocytes

SALMA MIKHAIL, M.D.* MERLE K. LOKEN, M.D. Ph.D.* and LEE A. FORSTROM, M.D., Ph.D.*

Indium-111 labeled leukocyte (In-111-WBC) imaging has been shown to be effective in the diagnosis of inflammatory disease. However, several possible pitfalls in the use of this procedure have been described. Among these, we previously reported In-111-WBC localization in the bowel of a patient with cystic fibrosis, due to swallowing of labeled cells in sputum. We report here on similar findings in a patient with sinusitis, and compare these findings with those in another patient studied during the same week. Care should be exercised in interpreting bowel uptake of In-111-WBC in patients with upper respiratory infections.

INDIUM-111 labeled leukocyte scanning has been shown to be effective in the detection of abscesses or other manifestations of inflammatory disease in the abdomen¹. However, several potential pitfalls in the use of this test have been described². We have previously reported a case in which intestinal localization of Indium-111 leukocytes (In-111-WBC) occurred in a patient with cystic fibrosis, presumably due to swallowing of the radiolabelled sputum³. In this report we describe a similar finding of intestinal localization of Indium-111 WBC in a patient with sinusitis, and compare the scintiphotos taken to those obtained after administration of In-111-WBC in another patient during the same week.

Methods

Indium-111 WBC were prepared from leukocytes obtained from the patient's blood, using methods previously reported^{4,6}. Whole body scan and selected camera images were obtained at approximately 24 and 48 hours after injection.

Results

Case 1

This 72-year-old white male had undergone a radical cystectomy with placement of an ilealloop secondary to a bladder carcinoma. The patient's post-operative course was complicated by fever, sepsis and renal insufficiency. At 24 hours following the administration of 425 microcuries of In-111-WBC the scans

shown in Figures 1(A) and 1(B) were obtained. These scans show a large multicentered collection of radioactivity in the right lower quadrant and pelvis. On

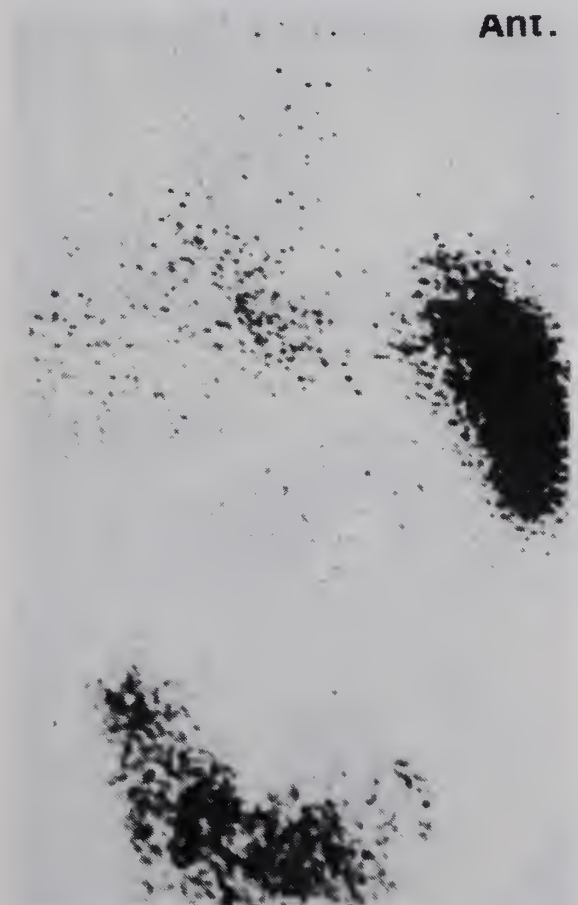


Fig. 1(A) — Anterior In-111-WBC scan showing large area of increased activity in the right lower quadrant and pelvis.

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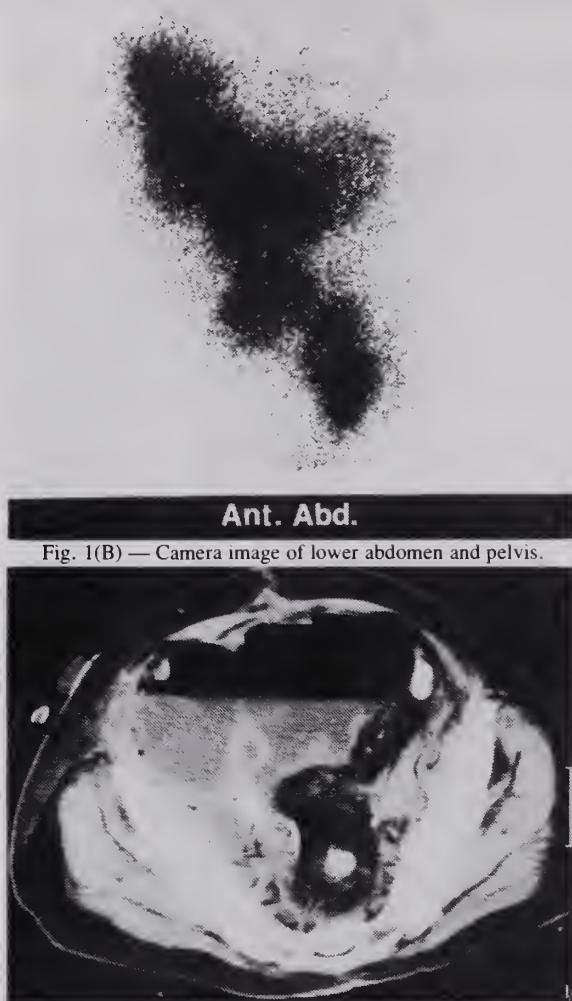


Fig. 1(B) — Camera image of lower abdomen and pelvis.

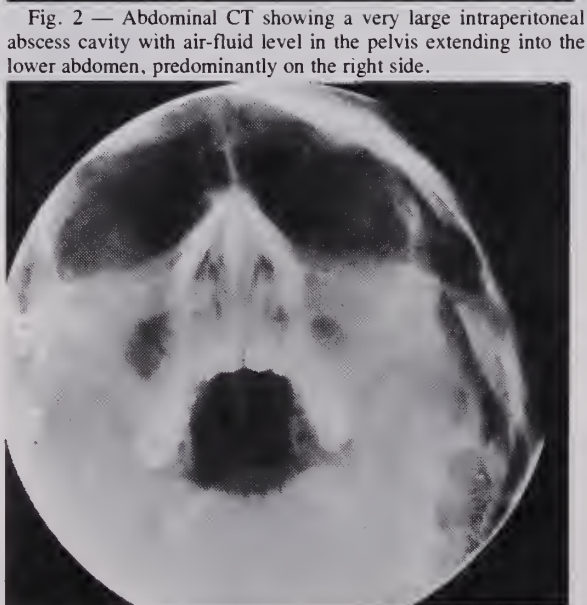


Fig. 2 — Abdominal CT showing a very large intraperitoneal abscess cavity with air-fluid level in the pelvis extending into the lower abdomen, predominantly on the right side.

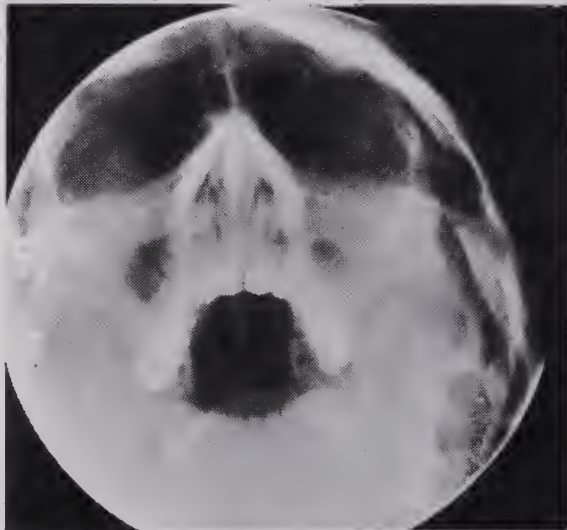


Fig. 3(A) — Sinus radiograph in a 48 year old female showing changes of maxillary sinusitis.

the following day an abdominal CT scan was obtained (Figure 2). A review of all slices obtained during this study showed a very large intraperitoneal abscess cavity in the pelvis which extended into both groin areas and along the pelvic wall, predominantly on the right side, with the appearance of a large air-fluid level. At surgery an anastomotic leak was identified at the site of reanastomosis of the ileum. A large abscess was also found and drained.

Case 2

This 48-year-old female had a four year history of chronic lymphocytic leukemia. She had been treated with chemotherapy in the interim with a good clinical response. Recently she had experienced facial and suborbital pain with some evidence of purulent rhinorrhea. Sinus films (Figure 3A) showed moderate thickening of the mucosa in both maxillary sinuses. There was a past clinical history of chronic bilateral paranasal and maxillary sinusitis. A total body scan was obtained at 24 hours following the intravenous administration of 430 microcuries of In-111-WBC, showing prominent focal uptake in the paranasal and maxillary region (Figure 3B), as well as diffuse uptake in the region of the colon (Figure 4). Because the patient had no abdominal complaints or other evidence of inflammatory disease in the intestine, a repeat scan was obtained the following day (48 hours), after bowel cleansing. There is a striking difference in the appearance of abdominal activity in the two scans, indicating that in this instance the radioactivity appears to be in the intestinal contents secondary to the swallowing of radiolabelled leukocytes from nasal and sinus drainage.



Fig. 3(B) — Anterior view of the head showing focal uptake of In-111-WBC in the sinus region.

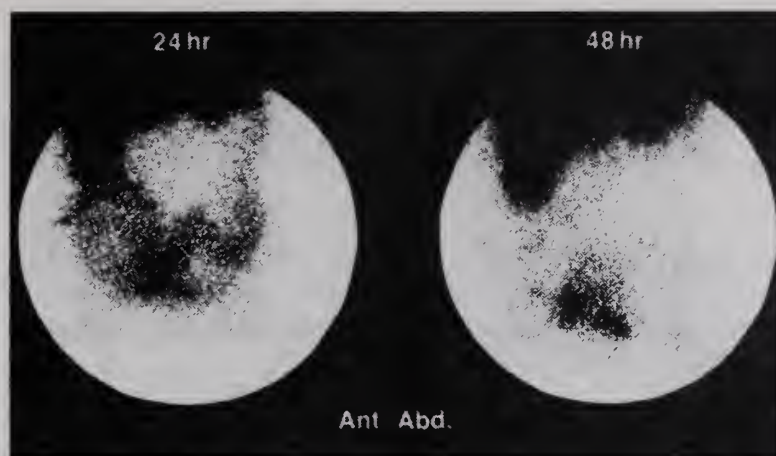


Fig. 4 — Anterior abdominal views of In-111-WBC scan in patient with sinusitis (case 2), showing significant activity in bowel at 24 hours (left); this has largely cleared at 48 hours (right), after bowel cleansing.

Discussion

We have recently reviewed our experience in the use of In-111-WBC in 1,178 patients with suspected inflammatory disease at a variety of sites⁷. Likewise, other investigators have reported on the successful use of In-111-WBC for these purposes^{8,9}. In the large series referred to above, we reported a sensitivity of 80% and a specificity of 97% for an overall accuracy of 91%. In comparison with 67-Gallium citrate imaging, the use of In-111-WBC has the advantage of showing no significant uptake in the bowel in normal subjects. Hence, intestinal or abdominal localization of In-111-WBC should be regarded as abnormal and

usually indicates the presence of inflammatory disease. However, In-111-WBC may enter the bowel by way of swallowing, as we previously reported in a patient with cystic fibrosis³. Similar findings were observed in one of the studies reported here, that of a patient with sinusitis. In both instances, abnormal uptake of In-111-WBC was seen in the respiratory tract. Since such activity may enter the alimentary canal by swallowing as well as in cases of bowel inflammation and/or abscess, care should be exercised in interpreting bowel localization of In-111-WBC.

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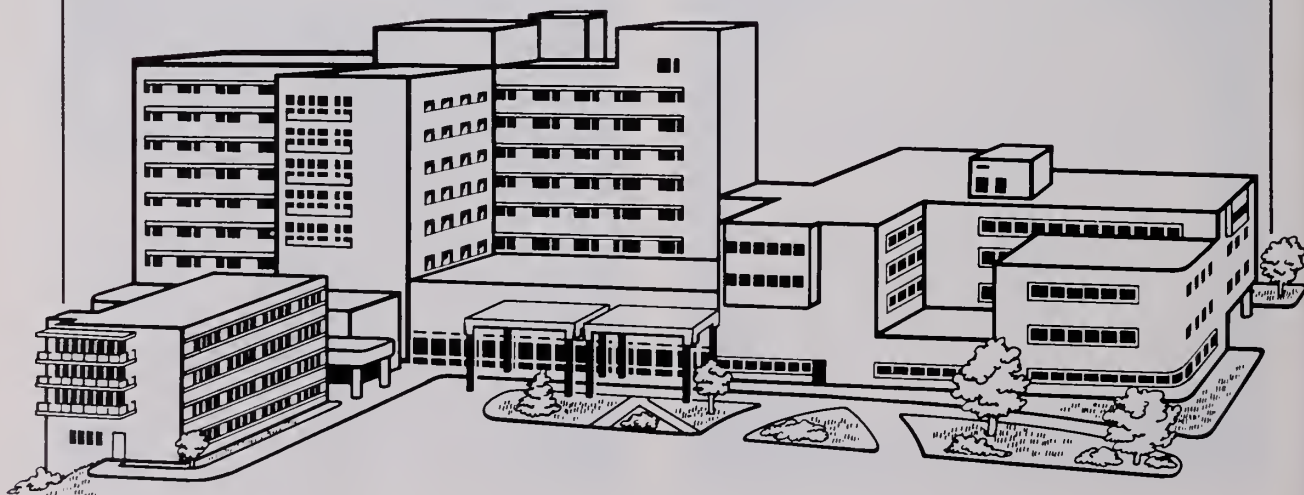
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Follow-Up of the Very Low Birth Weight Infant

(Less Than 1251 Grams)

RONALD E. HOEKSTRA, M.D.;* ELIZABETH A. PERKETT, M.D.;† MARTHA DUGAN, R.N.C.;‡ G. ERIC KNOX, M.D.;#

In addition to improved survival of the very low birth weight infant, follow-up has shown that the majority of survivors are normal. This improved outcome has occurred coincidentally with an increase in the number of maternal referrals and inborn infants, as well as with a change in the type of neonatal coverage in the NICU.

DURING THE PAST several years, the pediatric, obstetric and perinatal literature has included many reports documenting the increased survival among very low birth weight infants. Survival rates which were considered unattainable ten years ago are now widely and commonly reported.^{1, 2, 3} Coincident with increased survival have been questions regarding subsequent morbidity: i.e., the quality of survival.

This preliminary report attempts to address these concerns. Increased survival of very low birth weight infants over a four-year period at Minneapolis Childrens Health Center is documented. Follow-up data on surviving infants with birth weights less than 1251 grams suggest the majority of these infants to be developmentally normal.

Methods

Infants were first seen in follow-up when their corrected chronological age (i.e., gestational age) was six months. At that time, an assessment of motor and cognitive abilities, using the Bayley Scale of Infant Development, was employed. Infants were also seen by an audiologist, who performed a hearing screen as well as impedance audiometry. An interim history was taken by a neonatal nurse clinician, and the infant was also seen by a physician for physical and neurological examination.

At 18 months, the infants were seen by a psychologist, who once again administered the Bayley Scale of Infant Development, a nurse clinician, and a physician. The infants were seen by a speech pathologist, who administered the Zimmerman Preschool Language Evaluation, at 30 months, in addition to once again being seen by a physician. At four years of age,

these children were seen by a psychologist, who administered the Search Screen, a preschool screening instrument used by the Minneapolis Public Schools.

Findings on neurological examination were categorized as normal, minor deficit, or major deficit. Infants were categorized as having a major neurological deficit if they had cerebral palsy, blindness, deafness, hydrocephalus, or mental retardation. Infants having isolated strabismus, mild unilateral retinopathy of prematurity, hyperactivity, or a mild isolated developmental delay, were categorized as having a minor neurological deficit. Infants with normal neurological examinations, but who had a developmental quotient between 70 and 80 on the Bayley Scale of Infant Development, were categorized as having a minor neurological deficit on the basis of their developmental delay.

Results

During a four-year period from April 1, 1977 through March 31, 1981, 227 infants with birth weights of less than 1251 grams, were admitted to the NICU at Minneapolis Childrens Health Center. One hundred thirty-seven (137) of these 227 (60%) infants survived and were discharged home. Sixty-six (66) of 129 (51%) infants weighing less than 1001 grams survived (Table 1).

TABLE 1

INFANTS \leq 1250-GRAMS
(APRIL 1977 - MARCH 1981)

<u>BIRTH WEIGHT</u>	<u>LIVED</u>	<u>DIED</u>	<u>% SURVIVAL</u>
< 750 GRAMS	14	31	31%
751-1000 GRAMS	52	32	62%
1001-1250 GRAMS	<u>71</u>	<u>27</u>	<u>72%</u>
TOTALS	137	90	60%

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For comparison purposes, the babies have been divided into two groups. The early group (Group I) consists of 92 infants born between April 1, 1977 and March 31, 1979. The later group is made up of those 135 infants born between April 1, 1979 and March 31, 1981 (Group II). As shown in Tables 2 and 3, Group II differs significantly from Group I with regard to percentage of inborn infants ($p < .01$), overall survival ($p < .01$), and survival of infants with birth weights less than 1001 grams ($p < .01$). Birth weight was a major determinate in both inborn and outborn survival. The mean birth weight of survivors was significantly ($p < .01$) greater (999 grams) than the mean birth weight of infants who died (849 grams).

TABLE 2
PLACE OF DELIVERY

	INBORN	OUTBORN
GROUP I	17%*	83%
GROUP II	72%*	28%

* $P < .01$

TABLE 3
INFANTS \leq 1250 GRAMS/8 SURVIVAL

BIRTH WEIGHT	GROUP I APRIL 1977-MARCH 1979 (92 INFANTS)		GROUP II APRIL 1979-MARCH 1981 (135 INFANTS)	
\leq 750 GRAMS	21 (3/14)	36 (16/45)	55 (11/31)	60 (50/64) ¹²
751-1000 GRAMS	42 (13/31)		74 (39/53) ¹²	
1001-1250 GRAMS	66 (31/47)		78 (40/51)	
TOTALS	51 (47/92)		67 (90/135) ¹²	

¹² $p < .01$

Among the 137 long-term survivors, there were four late deaths following discharge home. Two infants died from Sudden Infant Death Syndrome (SIDS), one died of renal failure secondary to congenital nephrosis, and one died of respiratory failure secondary to severe bronchopulmonary dysplasia (BPD). One hundred sixteen (116) of the 133 long-term survivors (87%) have been seen in follow-up. The mean chronological age at the time of most recent follow-up for infants in Group I was 32.5 months, and the mean age of follow-up for infants in Group II was 15 months (Table 4).

Ninety-four (94) of 116 (81%) infants seen in follow-up had a normal neurological examination. However, six of these 94 infants had a mild, isolated developmental delay, leaving 76% of all infants seen in follow-up categorized as entirely normal. In addition to the six infants with isolated developmental

delay, another 12 infants had minor neurological deficits. Ten (9%) infants had major neurological deficits. The mean birth weight for infants with normal neurological examinations (999 grams) was significantly greater than the mean birth weight of those infants who had major neurological deficits (849 grams) ($p < .006$) (Table 5). Unlike birth weights, place of birth, gestational age, or assisted ventilation did not predict presence or absence of neurological deficits.

Discussion

It has generally been recognized that improved survival of the very low birth weight infant has occurred

TABLE 4
FOLLOW-UP
116/133 (87%) — SEEN IN FOLLOW-UP

AGE AT FOLLOW-UP:

GROUP I — 32.5 MONTHS

GROUP II — 15.0 MONTHS

TABLE 5
FOLLOW-UP: 116 INFANTS

		MEAN BIRTH WEIGHT	MEAN GESTATIONAL AGE
NORMAL NEURO EXAM	81% (94/116)	999 GRAMS ¹²	27.7 WEEKS
ISOLATED DEVELOPMENTAL DELAY	6% (6/94)	922 GRAMS	28 WEEKS
ENTIRELY NORMAL	76% (88/116)	987 GRAMS	27.7 WEEKS
MINOR NEURO DEFICIT	15% (18/116)	970 GRAMS	29 WEEKS
MAJOR NEURO DEFICIT	9% (10/116)	849 GRAMS ¹²	27 WEEKS

¹² $p < .01$

in association with significant changes in the perinatal environment. For example, the increased survival of the very low birth weight infant documented in this and in other studies, occurred in association with increased numbers of inborn as opposed to outborn admissions to neonatal intensive care units. However, using this change in referral pattern as an explanation for the better outcome observed may be far too simplistic. For example, during the time period in question, at least one major change in the way perinatal care is delivered occurred. Full-time neonatal coverage in the NICU and at all high-risk deliveries was instituted. That this may have had a positive effect on survival is suggested by the studies of Tyson, et al.⁴. Alternatively, significant refinements in ventilator care, changes in obstetrical attitude toward survival of premature infants, or other as yet undefined factors

may account for the demonstrated improvement in perinatal outcome.

Whatever the cause for improved perinatal outcome, it is clear from the data presented, that increased survival accompanied normal development in at least 75% of surviving infants. Moreover, the percentage of normal infants remains constant as the total number of surviving infants increases. Even though the absolute number of infants with severe neurological deficits has increased as a result of improved perinatal care, the elimination of this care would result in the deaths of several thousand otherwise normal surviving infants.

Summary

It is suggested that follow-up of the very low birth weight infants validates the importance of maximizing the care offered to the perinatal patient. When

viewed from a total perinatal perspective, the results presented represent minimal achievement. That is, as the patient cared for is older or heavier, mortality and morbidity improve dramatically (Table 6). Moreover, continuing advances in medical knowledge and organization of care promises even better results for all babies in the future.

TABLE 6
COMPARISON OF OUTCOME WITH OTHER CENTERS

	NUMBER OF INFANTS	% SURVIVAL	% FOLLOW-UP	NORMAL	MAJOR HANDICAPS
≤ 1250 GRAMS (MEANS) (9 STUDIES)	157	39%	84%	59	22%
≤ 1500 GRAMS (MEANS) (4 STUDIES)	233	61%	86%	70%	17%
MCHC (≤ 1250 GRAMS)	227	60%	87%	76%	9%

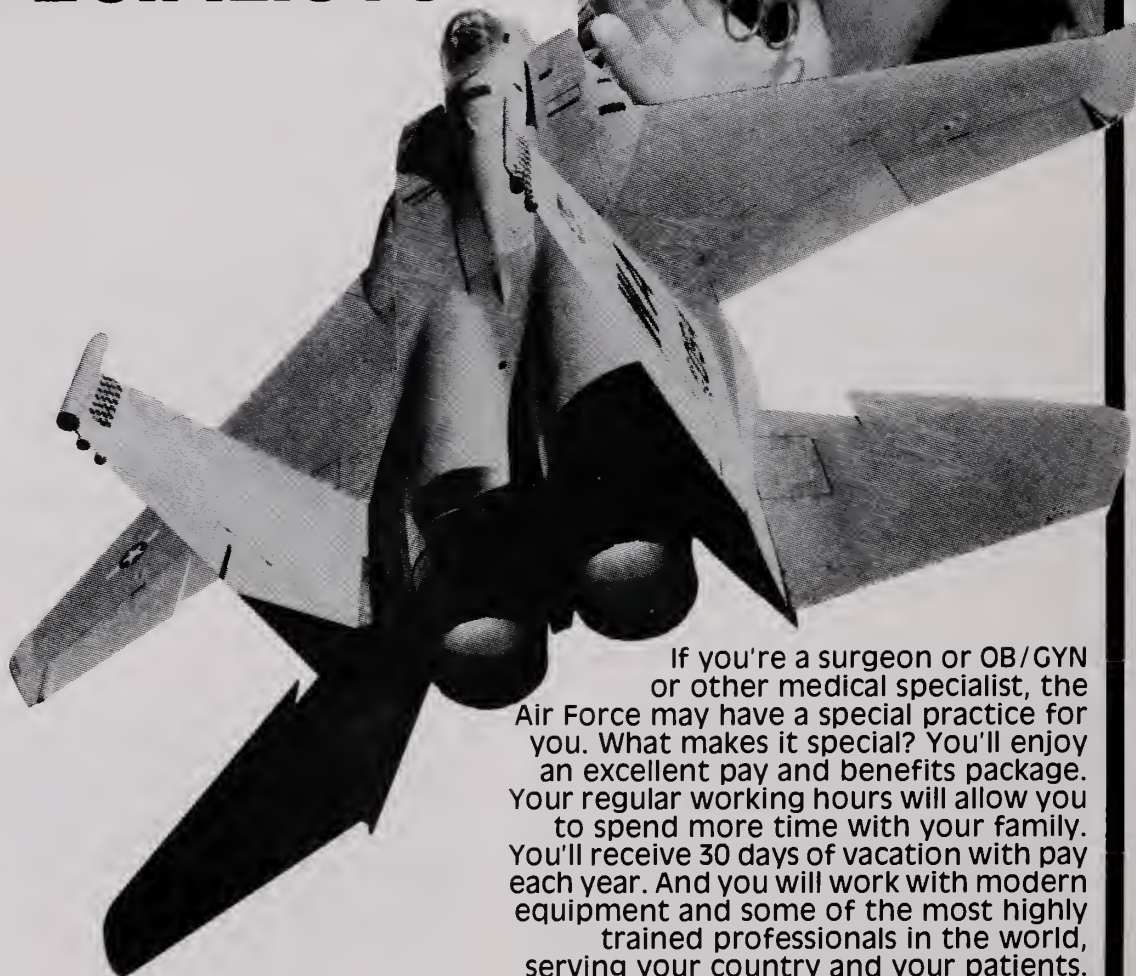
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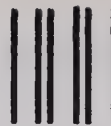
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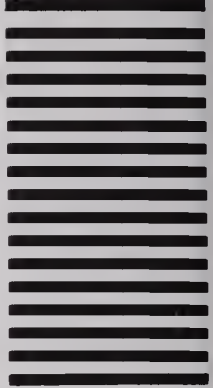
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Laryngotracheobronchitis

Tissue Marker of a SIDS Subgroup

RALPH A. FRANCIOSI, M.D.*

This study confirms the report of Williams that tracheobronchitis is a tissue marker of a distinct SIDS subgroup. In this study 24% of SIDS cases had this marker. These infants were usually males, twelve weeks or older and had a minor URI at the time of death. A hypothesis to explain the final common pathway in these SIDS cases is presented.

FROGGATT ET AL.¹, in a scholarly epidemiological study of SIDS, concluded: "The characteristic age range is the most important factor, and there seems little doubt that these infants die because, while passing through this period of increased physiological vulnerability, some critical combination of intrinsic and extrinsic factors proves lethal: what is in doubt is the mechanism or final common pathway of death". They added "Any orthodox interpretation of our results must ascribe some role to infection, namely respiratory infection".

Williams² reported a subgroup of SIDS infants in whom death appeared triggered by an upper respiratory viral infection. These infants were usually older than three months and died in colder weather. This paper will attempt to confirm his observations.

Materials and Methods

All SIDS autopsies performed at the Minneapolis Children's Health Center between January 1, 1980 and July 1, 1982 were studied. Representative microscopic sections of larynx, trachea, major bronchi and lungs were examined for inflammation. The type of inflammatory cells was recorded as: segmented leucocytes, lymphocytes and plasma cells. The extent of mucosal inflammation was considered focal if less than one third of the mucosal circumference was involved and diffuse if the area was greater than one third. The intensity of mucosal inflammation was graded at 400X magnification as follows: 0 = absence of inflammatory cells; 1+ = 1-10 cells; 2+ = 11-20 cells; and 3+ = > 20 cells. The clinical data was reviewed on each case. Infants between four weeks and 11 months of age who died of congestive heart failure secondary to congenital heart disease

were considered autopsy controls. A section taken from the trachea on each control was examined microscopically for the type, extent and intensity of mucosal inflammation.

Results

Sixty-three SIDS cases were studied and none had luminal exudate, mucosal ulceration or edema in the larynx, trachea or major bronchi. Table 1. compares SIDS cases with moderate or marked diffuse microscopic laryngotracheobronchitis (M.L.T.B.) to those infants without. Inflammatory cells in all cases were a mixture of lymphocytes and plasma cells. The control group consisted of 47 infants in whom three (7%) had > 2+ microscopic inflammation within tracheal mucosa, 14 (31%) with <2+ inflammation and 28 (62%) with no inflammation.

Discussion

Our study confirms Williams² report that a significant subgroup of SIDS have microscopic inflammation of the lower respiratory tract. These lesions are neither associated with narrowing of the airway by mucosal edema nor purulent exudate or pneumonia. They are presumed to be a marker of viral infection and not an explainable cause of death. We agree that this lesion usually occurs in SIDS cases older than 12 weeks who have a minor URI at the time of death. We

TABLE 1. S.I.D.S. CASES WITH M.L.T.B.

MLTB	CASES	SEX- MALE	AGE 12wks	Pet.+	Aspir.+	URI 48hrs	COLD 11-3	SEASONS MILD 4,5,9,10	WARM 6-8
>2+ infl	(241) 15	(731) 11	(671) 10	(871) 13	(201) 3	(871) 13	(421) 7	(471) 7	(71) 1
<2+ infl	(761) 48	(561) 27	(331) 16	(961) 46	(191) 9	(231) 11	(461) 22	(381) 18	(171) 8
TOTALS	(1001) 63	(601) 38	(411) 26	(931) 59	(191) 12	(381) 24	(461) 29	(401) 25	(141) 9

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would add that the majority of infants are males. We disagree that most deaths occur in colder months since our cases had an equally high occurrence in cold or mild weather.

The epidemiological characteristics of M.L.T.B. i.e. male, three months or older, URI; suggest a viral upper respiratory infection as the cause of this lesion. Indeed, clinical viral upper respiratory infection has a similar epidemiology.^{3,4} However, this lesion is not considered lethal since it is not accompanied by airway obstruction, pneumonia or other potentially lethal tissue lesions.

Infants between one month and six months of age are vulnerable to hypoxia during sleep. This vulnerability is a combination of peculiar upper airway anatomy and sleep state physiology characteristic of this developmental period. The nose is the usual route for air intake in infancy.^{5,6} and any compromise of the upper airway volume would result in compensatory responses to decreased air inflow. A URI can cause rhinorrhea, nasal mucosal edema and adenoid hypertrophy, a combination of which would result in restricted nasal air inflow.⁷ The sleep state

physiology of early infancy is characterized by a gradual organization of sleep-wakefulness patterns.⁸ Transition towards an organized pattern is disrupted in some infants with nasopharyngitis.⁹

I would propose that sudden death precipitated by M.L.T.B. occurs in infants with abnormal hypoxia compensatory mechanisms during sleep. These mechanisms are involuntary and correct hypoxemia and hypercarbia during sleep. This compensation is dependent upon an involuntary reflex circuit composed of peripheral chemoreceptors, vagal afferents, brain stem respiratory centers, vagal efferents and a cerebral sleep arousal mechanism.¹⁰

Morphologic studies on SIDS infants have demonstrated in some cases abnormalities in carotid bodies,^{11,12} vagus nerves¹³ and brain stem^{14,15,16} which suggest an malfunctioning hypoxia compensation reflex mechanism. In addition, studies reported on some "near-miss SIDS infants" indicate an abnormal sleep state arousal mechanism.¹⁷ I feel then it is not unreasonable to speculate that abnormal hypoxia compensation mechanisms during sleep could be the cause of SIDS deaths triggered by a viral URI.

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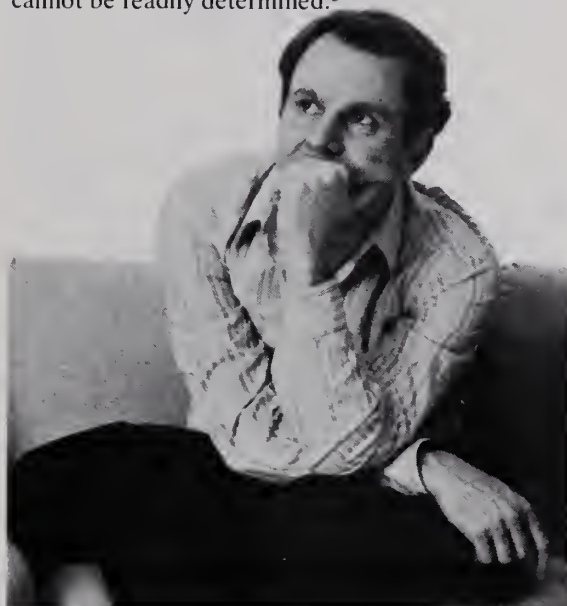


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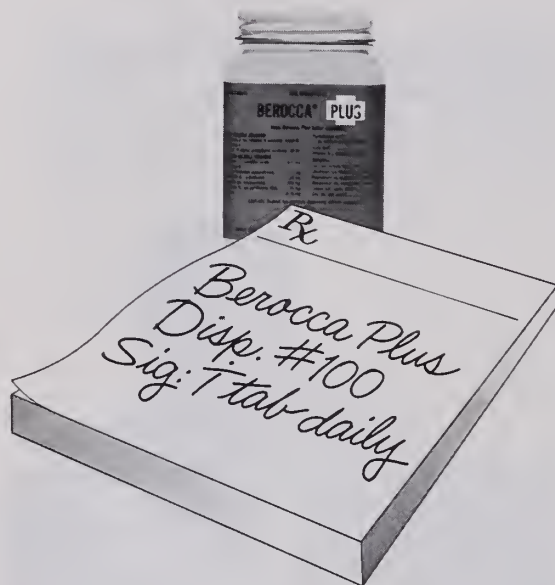
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I Had A Dream

CARL O. RICE, M.D.
Editor Emeritus

I was awakened in the crystal-clean skies of the latter decades of the 21st Century, able to look back at the previous century: the atom-suffused clouds of 1945-50, the smoky-smoggy heavens of the '50s and '60s, and the war-rumblings of the '70s and '80s.

In my dream I could see that during those ominous decades of the 20th Century we of the medical establishment had exploited to the utmost our elite professional image and the honorable tradition of independence, authority, and integrity. Maybe it was we ourselves who had compelled the Administration in Washington to intervene on behalf of the nation's ill in our affairs. I could see that we were so involved in self-induced bureaucracy and internecine struggle that we could scarcely continue private practice in our traditional humanitarian and altruistic manner.

Unfortunately, it was the belligerent and vociferous few among us who were responsible for this disastrous debacle by overruling the apathetic majority and influencing the voting delegates to make numerous unwise decisions culminating in our collapse and, unfortunately, in our loss of public respect.

The "nattering nabobs of negativism" in that scandal ridden century had prevailed, and our once proud medical profession had been absorbed into the confining limbo of rigid bureaucracy, controlled by a set of rules and regulations, with meetings, committees, conferences and clubs congregating at breakfasts, brunches, lunches, and dinners, where we consumed too many calories and imbibed too much coffee, while our loyal secretaries were calling our wives to announce that we would be later arriving home than previously anticipated. In addition to this chore it was incumbent on our secretaries to inform our weary-waiting patients in the office that we had been "detained" and that their scheduled appointments would have to be postponed until another day. In the meantime, we doctors joined the general population to become a nation of fat tubs and skinny anorexiacs-nervosa, about equally divided.

As a result of our heedlessness we found ourselves mired down in the bureaucratic red tape of thousands of committees and resolutions monopolizing the time and energy of our local, state, and national organizations: a vicious cycle originally instituted and later

implemented for the very purpose of keeping the Federal Government off our backs and out of our hair.

We had failed!

The individual practicing physician, no matter what his specialty, became anonymous. He faded away into a large group where patients entered with a number and, after three or four days, were cranked out, so to speak, emerging with a print-out diagnosis emanating from statistically evolved scans and probings, following an analysis of a variety of body samples. Each patient was then given a half dozen prescriptions and a mimeographed routine to be followed. The treatment of organic disease was directed by a set of typewritten rules and regulations.

"Number 468-52-5379 next, please!"

This regimented assembly-line procedure was instituted, if not deliberately calculated to make the patient feel diminished, divested of any shreds of self-worth his humiliating number status had not already deprived him of.

Patients with functional ailments gravitated to the quacks and charlatans where they could expect more individual consideration and a chance to get things off their chests. Psychiatric patients had to attend group sessions, because no psychiatrist was sufficiently motivated, under federal aegis, to deal with individual patients. Nor did he have time or interest.

The patient's record was clear, substantive, and properly punched for the Utilization IBM machine, because the system required proof that the doctor had discharged his assigned responsibility. Also the physician needed this substantiation in the event of litigation, for, regardless of what any patient or interested witness might testify to, the record would speak for itself. *Ex cathedra!* In fact, the cost of litigation insurance often exceeded the annual income of most doctors: an ironic paradox due to the rapacious demands of plaintiffs, their attorneys, and their doctors. Almost all diseases and even all symptoms had been declared, by categorical Supreme Court decision, to have been caused by incidents, accidents, or other doctors! For these remuneration became the only cure.

The patient with a surgical problem learned with resignation to assume his place on the waiting list according to the lettered severity of his disease. One

awaiting less urgent and more elective surgery often carried his waiting list number to his grave, having died of natural causes before his turn came up.

Organ transplantation had become commonplace, and it was not unusual to observe, at the demise of one of these multiple-transplant individuals, a battery of legal counsel waiting at hand, each to claim for his client a share of the inheritance which had accumulated from the original owner's contributed organ and from the generous donations of previous heirs and sympathizers.

Individuals with mechanical hearts, vinyl plastic vessels, synthetic lungs, metabolic livers, and dialyzing kidneys formed exclusive clubs of their own that arrogantly violated civil rights by excluding robots from their organizations.

Consultations were stored in magnetic-tape bins and could be dialed on a closed circuit. New telephonic devices had been invented so that the consultant could interrupt the canned consultee by dialing an additional number. This dialogue-cum-repartee sounded humorously and reminiscently like a shouting match on Echo Rock in the Valley of the St.

Croix.

A further innovation: a new language had been developed: the numerical-acronym. All specialists had their own patois of acronyms unintelligible to other specialists; we spoke in riddles; the Tower of Babel had returned.

The population had become static; eugenics was practiced and only rarely were a man and woman allowed to use their own seed. Though donors for the eugenics bank were at a premium, a genetic throw-back occurred just often enough to intimidate most couples from petitioning to produce more than their stipulated allotment of two offspring. However, an occasional religious fanatic proved sufficiently recalcitrant to insist on three in order to gain greater assurance of entering the Kingdom of the Hereafter. For do not the Scriptures adjure man: Be fruitful and multiply!

Also an occasional long-haired, bewiskered, tattooed and bauble-bedecked old-timer would reminisce nostalgically about the days of Old Doc Hess, when a man and a girl could be left alone with their own instincts.

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Varicella-Zoster Infections

Advances in the Prevention and Treatment

BONNIE BEAN, M.D.* and HENRY H. BALFOUR, JR., M.D.*

AT THE UNIVERSITY OF Minnesota Health Sciences Center we have been involved in the prevention and treatment of chickenpox and herpes zoster — infections due to varicella-zoster virus — since the mid 1970s. During the past decade, some important new therapeutic modalities — including vaccines, antiviral agents and prophylactic immunoglobulins — have greatly improved our ability to prevent and treat these diseases in both normal and immunocompromised patients. This article reviews these new developments.

Chickenpox

Prevention

A live, attenuated varicella vaccine has been developed by Japanese investigators and is being tested in this country.¹ It is both safe and effective and may ultimately be widely used to protect immunocompromised children (especially those with acute lymphoblastic leukemia) from the serious morbidity and mortality associated with primary varicella-zoster infections (chickenpox). However, important questions regarding duration of immunity and possible re-emergence of latent vaccine virus as herpes zoster must be answered before routine vaccination of healthy children can be undertaken.

Post-exposure passive immunization is currently the mainstay of chickenpox prevention in immunocompromised children and occasionally in immunocompromised adults, such as those who have undergone organ transplantation or have malignancies or inflammatory diseases for which they are receiving steroids, cytotoxic agents (cancer chemotherapy, azathioprine) cyclosporin or irradiation. Zoster immune globulin (ZIG), varicella-zoster immune globulin (VZIG), and zoster immune plasma (ZIP) are all effective for this purpose, but must be given within 72-96 hours of exposure in order to be of clearcut benefit.^{2,3} Household contact with infectious

persons (those who have vesicular eruptions or develop vesicles within the next 24 h) carry the greatest danger of transmission of chickenpox to an immunocompromised child, and such exposures should always be followed by prophylaxis.^{3,4} Face-to-face contact with any other infectious person for one hour or longer also carries a high risk of transmission and should be followed by prophylaxis. VZIG is available to all physicians by contacting the regional distribution centers of American Red Cross Blood Services. Transfer factor, a form of immunotherapy, may afford protection for a longer duration of time than VZIG, but is still in investigational stages.⁵

At the University of Minnesota Health Sciences Center, we have recently undertaken a study of VZIG and acyclovir together in the prophylaxis of chickenpox. Immunocompromised children under 18 years of age who have sustained a significant exposure to chickenpox within the previous 96 hours are eligible to enroll. They will receive VZIG free of charge in our emergency room and then will be randomized to receive either acyclovir or placebo capsules for 5 days. We hope to learn whether acyclovir can further reduce the incidence and severity of chickenpox in those children who receive VZIG prophylaxis.

Treatment

Treatment of chickenpox in immunocompromised children has been undertaken with human leukocyte interferon on an experimental basis and with the new antiviral agent, acyclovir. When interferon was given within 72 hours of appearance of the exanthem, it halted new lesion formation and reduced the risk of life-threatening dissemination of varicella.⁶ When acyclovir was given an average of 3-4 days into illness, it reduced the incidence of varicella pneumonia immunocompromised children.⁷ Interferon is not yet commercially available. Acyclovir is available for intravenous administration through most hospital pharmacies, but it has not yet been approved for treatment of varicella-zoster virus infections.

This work was supported by NIH grant AM18883 and by a grant from the Burroughs Wellcome Co., USA.

*Department of Laboratory Medicine and Pathology, University of Minnesota, Minneapolis.

Zoster*Immunocompromised Patients*

Herpes zoster, like chickenpox, is a disabling illness for immunocompromised patients, and can be fatal in those who develop severe pneumonitis, meningoencephalitis, or bleeding diatheses. Effective treatment is badly needed. Neither ZIP nor ZIG is effective in treatment of localized disease or prevention of disseminated zoster in these patients.^{8,9}

Vidarabine recently has been shown to accelerate skin healing and reduce the incidence of disseminated disease if given early in the course of zoster, i.e., within 72 hours of appearance of the skin rash.¹⁰ A placebo-controlled trial of the new antiviral agent, acyclovir, for treatment of acute herpes zoster in immunocompromised patients has just been completed.¹¹ There were no restrictions on duration of rash prior to entry in this trial, and patients were enrolled up to 45 days after onset of rash (median 3-6

TABLE 1

Effect of intravenous acyclovir on acute herpes zoster
in otherwise normal adults

	Acyclovir n = 19 (median day to event)	Placebo n = 10	P Value
<u>Skin healing</u>			
cessation of viral shedding	2	5	.02
cessation of new lesions	2	4	.03
50% healing	7	14	.007
overall cutaneous improvement*	2	3	.03
<u>Pain</u>			
decrease during therapy	2	5	.02
total cessation (therapy + follow-up)			
all patients	22	90	.16
patient > 50 y.	49†	180†	.09
<u>Overall clinical improvement§</u>	4	7	.004

*obtained by adding weighted scores for individual parameters

†n = 12 acyclovir and 6 placebo recipients

§obtained by adding weighted scores for individual parameters of skin healing and pain reduction

TABLE 2

Methods of prevention and treatment generally available for chickenpox and zoster

Disease	Host	Prevention	Treatment
Varicella (chickenpox)	Normal	none	consider i.v. acyclovir for severe or complicated cases ⁷
Varicella	Immunocompromised	VZIG	i.v. acyclovir
Zoster (shingles)	Normal	none	i.v. vidarabine
			consider i.v. acyclovir for severe or complicated cases
Zoster	Immunocompromised	none	i.v. acyclovir
			i.v. vidarabine

TABLE 3

Special treatment protocols available at University of Minnesota Health Sciences Center

Condition	Host	Treatment Protocol
Varicella exposure within previous 72 h	Immunocompromised < 18 years old	VZIG followed by trial of oral placebo-controlled acyclovir
Acute zoster (rash ≤ 3 d old)	Normal ≥ 18 years old	Placebo-controlled trial of oral acyclovir
Acute zoster (rash ≤ 3 d old)	Ambulatory, Immunocompromised ≥ 18	Placebo-controlled trial of oral acyclovir

days). Under these circumstances, acyclovir could not be shown to accelerate skin healing significantly. It did, however, halt progression of skin disease and decreased the frequency of cutaneous and visceral dissemination. In this population, prevention of disseminated disease may well be more important than acceleration of skin healing, especially if this can be achieved without instituting treatment very early in the disease, when patients may not have yet contacted a physician. Because acute zoster is often mild and does not require hospitalization and intravenous medication, we have designed an out-patient, placebo-controlled trial to evaluate treatment of immunocompromised acute zoster patients with oral acyclovir. We plan to implement this trial in the spring of 1983, and hope to learn if oral acyclovir also halts progression and dissemination of acute zoster.

Normal Adults

A major breakthrough in the treatment of acute zoster in otherwise healthy persons occurred with the demonstration that intravenous acyclovir reduced pain and accelerated skin healing in normal subjects (Table 1).^{12,13} On the basis of these exciting results, we currently are involved in a placebo-controlled trial of oral acyclovir for otherwise healthy persons who are 18 years of age or older and have had their rash for three days or less. High-dose intravenous acyclovir (800-1100 mg every 8 hours) given on an outpatient basis resulted in distressing side effects in some patients, including abdominal pain, nausea with occasional vomiting and transiently mildly elevated creatinine. These appeared to be due to relative dehydration in an outpatient population,¹⁴ and have occurred very frequently in hospitalized zoster patients who received a slightly lower dose (600-800 mg i.v. every 8 hours) and had their hydration

monitored. With oral acyclovir in a lower dose, we anticipate that these side effects will not occur.

Postherpetic neuralgia can be a severe and disabling complication for normal as well as immunocompromised persons. Vidarabine appeared to shorten the duration of postherpetic neuralgia in the immunocompromised host,¹⁰ and acyclovir has shown some promise in this regard in normal persons (Table 1), although the results were not statistically significant in our small group of patients. Amitriptyline and other tricyclic antidepressants and neuroleptics have been used successfully in the treatment of some cases of established postherpetic neuralgia¹⁵ and are currently in use at the University of Minnesota pain clinics. However, a truly effective regimen for the prevention or reduction of postherpetic neuralgia following acute zoster remains to be developed.

Other New Developments and Ongoing Studies

The Virology Section at the University of Minnesota Health Sciences Center is currently involved in determining optimal dosage regimens for acyclovir, and offers 24-hour telephone consultation regarding patient management. Plasma acyclovir level determinations are also performed by our laboratory and are available to all physicians through the University Outreach program. Our office has an informative laymen's brochure available to both physicians and patients regarding shingles, its complications and management. This brochure, and further information regarding patient referrals, acyclovir levels, or treatment protocols, may be obtained by calling our office at 612-373-8898, or for emergencies, 612-373-8484 and asking for the clinical virology physician or nurse on call.

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Drug Profiles

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ARDEN LOHMAN, PHARM.D.*

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Dissolution and absorption may be delayed when the macrocrystalline preparation (Macrochantin®) is used. This helps to minimize gastric irritation.

Metabolism

There is minor hepatic metabolism to inactive compounds; this route becomes significant when renal function is impaired.

Renal Elimination

The major route of elimination is by glomerular filtration and tubular secretion. Excretion is linearly related to creatinine clearance, but plasma concentration is not.

Half-life

The elimination half-life in patients with normal renal function is 0.3 to 1.0 hours. Patients with a creatinine clearance of less than 80 ml/min/1.73 m² show a prolonged half-life with significant systemic accumulation. Therapeutic urine concentrations are not attained in patients whose creatinine clearance is less than 30 to 60 ml/min/1.73m², depending on the organism.

Adult Dose

The usual dose is 50 mg QID or 50 to 100 mg H.S. The usual MIC is 32 mcg/ml with higher con-

centrations required for some strains of Klebsiella, Enterobacter, and Proteus. Acinetobacter, Providencia, Pseudomonas, and Serratia are generally resistant. Nitrofurantoin is available as macrocrystalline capsules in 25 mg, 50 mg, and 100 mg doses; as tablets in 50 mg and 100 mg doses; as a 25 mg/5 ml suspension; and as a 180 mg/vial powder for injection.

Interactions

Nalidixic acid has been shown to antagonize nitrofurantoin in vitro. Probenecid and sulfapyrazone may inhibit renal tubular secretion, thereby increasing plasma concentrations and decreasing urine concentrations. This may minimize the drug's activity and increase its toxicity. It may interfere with urine glucose determinations causing a false positive on copper sulfate tests (Clinitest®). Cellulose derivative laxatives (Metamucil®, Effersyllium®) may bind nitrofurantoin in the gastrointestinal tract.

Adverse Effects

The most common side effect is dose related nausea which may be caused by gastric irritation or a central mechanism. It is easily minimized by dividing the daily dose, taking it with meals, and using the macrocrystalline preparation.

The serious toxicities one needs to be alerted for are detailed below:

Polyneuropathies (moderate frequency)

Increased serum concentrations appear to be associated with the onset of neuropathy which includes degeneration of sensory and motor nerves. It can develop within days of treatment initiation, usually manifest by a "stocking glove" sensation commonly in the lower extremities. The drug should be discontinued at the first sign of numbness or tingling.

Pulmonary (infrequent)

Acute: There have been over 20 cases of hypersensitivity pulmonary reactions reported. It usually develops several days after treatment initiation. Eosinophilia appears a few days after the onset of symptoms. Symptoms may progress from a mild "flu-like" sensation, to dyspnea, cough, fever, and severe

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Currently, resident at Stanford University Medical Center, Stanford, California.

pulmonary edema. There is rapid recovery after discontinuing the drug. Steroids may be useful in alleviating symptoms.

Subacute: These reactions occur approximately one month following treatment initiation and are characterized by dyspnea, tachypnea, persistent/progressive cough, interstitial pneumonitis and/or fibrosis. Resolution usually occurs one week to several months following discontinuation.

Chronic: These reactions are insidious in onset after prolonged therapy of six months or more. They are often associated with development of a non-productive cough, DOE, malaise, alterations in pulmonary function, and diffuse interstitial pneumonitis and/or fibrosis. Sequelae are usually irreversible but

may respond variably to steroids.

Hepatotoxicity and nephrotoxicity are very rare and usually are associated with a hypersensitivity etiology.

Contraindications or Cautions

Patients with G6PD deficiency may develop hemolytic anemia. Patients with pre-existing peripheral neuropathy, pulmonary disease, and renal impairment may be more susceptible to the serious toxicities. Patients with creatinine clearances < 30 ml/min/ 1.73m^2 may attain ineffective urine concentrations. Patients with creatinine clearances < 80 ml/min/ 1.73m^2 should be watched closely for signs of toxicity associated with accumulation.

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Cover Photograph "Harmony of Colors"

"Harmony of Colors" was taken on the Isle of Victoria, British Columbia, Canada, last Fall, by Dr. Freeman D. Kovack while he and his family were on vacation. He used a Nikon F3, zoom lens.

This is the third time Dr. Kovack has had one of his slides on the cover of MINNESOTA MEDICINE. The October 1982 issue of MINNESOTA MEDICINE featured his "Rhapsody in Gold."

Dr. Kovack is a family practitioner practicing in a group practice in Minneapolis. His medical education was obtained at the University of Vienna; and he has practiced here in Minnesota since 1952.

Anxious patients improve in just a few days

And what is more reassuring than an excessively anxious patient than medication that promptly starts to relieve his comforting symptoms? Valium® (diazepam/Roche) begins working within 30 to 60 minutes. Patients continue to improve in just a few days, and relief continues throughout the course of treatment.

There are other important benefits with Valium as well—along with its broad clinical range, Valium has an efficacy/safety profile that few, if any, drugs can match. This record has been achieved with extensive clinical experience, undoubtedly including yours. And, as you must have observed, side effects more serious than drowsiness, fatigue or ataxia rarely occur. Nevertheless, as with any CNS-acting agent, patients should be cautioned about driving, operating hazardous machinery or ingesting alcohol or other CNS-depressant drugs while taking Valium.

Yet another benefit Valium affords is flexibility.






Available in 2-mg, 5-mg and 10-mg scored tablets, Valium enables you to titrate dosage to individual patient needs. For the geriatric patient, a starting dosage of 2 to 2½ mg once or twice a day is recommended. And, for patients who forget or skip medication, you can prescribe Valrelease™ (diazepam/Roche) 15-mg slow-release capsules,

knowing that Valrelease will assure all the benefits of Valium 5 mg *t.i.d.* with the convenience of once-a-day dosage.

Discontinuation of Valium (or Valrelease) is typically as smooth as its start in short-term therapy. However, Valium and Valrelease should be discontinued gradually after more extended treatment. As you diminish dosage, the built-in tapering action of Valium and Valrelease will help avoid rapidly recurring anxiety symptoms and symptoms of withdrawal, and will help ease the patient's transition to independent coping when therapeutic goals have been achieved.

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the unique benefits of
Valium®
diazepam/Roche

Valium® (diazepam/Roche)  Tablets
Valrelease™ (diazepam/Roche)  slow-release Capsules
Injectable Valium® (diazepam/Roche) 

Before prescribing, please consult complete product information, a summary of which follows.

Indications: Management of anxiety disorders, or short-term relief of symptoms of anxiety. Anxiety or tension associated with the stress of everyday life usually does not require treatment with an anxiolytic. Symptomatic relief of acute agitation, tremor, impending or acute delirium tremens and hallucinosis due to acute alcohol withdrawal; adjunctively in: relief of skeletal muscle spasm due to reflex spasm to local pathology; spasticity caused by upper motor neuron disorders; athetosis; stiff-man syndrome. *Oral forms* may be used adjunctively in convulsive disorders, but not as sole therapy. *Injectable form* may also be used adjunctively in: status epilepticus; severe recurrent seizures; tetanus; anxiety, tension or acute stress reactions prior to endoscopic/surgical procedures; cardioversion.

The effectiveness of diazepam in long-term use, that is, more than 4 months, has not been assessed by systematic clinical studies. The physician should periodically reassess the usefulness of the drug for the individual patient.

Contraindications: Tablets or capsules in children under 6 months of age; known hypersensitivity; acute narrow angle glaucoma; may be used in patients with open angle glaucoma who are receiving appropriate therapy.

Warnings: As with most CNS-acting drugs, caution against hazardous occupations requiring complete mental alertness (e.g., operating machinery, driving). Withdrawal symptoms similar to those with barbiturates and alcohol have been observed with abrupt discontinuation, usually limited to extended use and excessive doses. Infrequently, milder withdrawal symptoms have been reported following abrupt discontinuation of benzodiazepines after continuous use, generally at higher therapeutic levels, for at least several months. After extended therapy, gradually taper dosage. Keep addiction-prone individuals (drug addicts or alcoholics) under careful surveillance because of predisposition to habituation/dependence.

Usage in Pregnancy: Use of minor tranquilizers during first trimester should almost always be avoided because their use is rarely a matter of urgency and because of increased risk of congenital malformations, as suggested in several studies. Consider possibility of pregnancy when instituting therapy; advise patients to discuss therapy if they intend to or do become pregnant.

ORAL: Advise patients against simultaneous ingestion of alcohol and other CNS depressants.

Not of value in treatment of psychotic patients; should not be employed in lieu of appropriate treatment. When using oral forms adjunctively in convulsive disorders, possibility of increase in frequency and/or severity of grand mal seizures may require increase in dosage of standard anticonvulsant medication; abrupt withdrawal in such cases may be associated with temporary increase in frequency and/or severity of seizures.

INJECTABLE: To reduce the possibility of venous thrombosis, phlebitis, local irritation, swelling and, rarely, vascular impairment when used IV: inject slowly, taking at least one minute for each 5 mg (1 ml) given; do not use small veins, i.e., dorsum of hand or wrist; use extreme care to avoid intra-arterial administration or extravasation. Do not mix or dilute with other solutions or drugs in syringe or infusion flask. If it is not feasible to administer Injectable Valium directly IV, it may be injected slowly through the infusion tubing as close as possible to the vein insertion.

Administer with extreme care to elderly, very ill, those with limited pulmonary reserve because of possibility of apnea and/or cardiac arrest; concomitant use of barbiturates, alcohol or other CNS depressants increases depression with increased risk of apnea; have resuscitative facilities available. When used with narcotic analgesic eliminate or reduce narcotic dosage at least 1/3, administer in small increments. Should not be administered to patients in shock, coma, acute alcoholic intoxication with depression of vital signs.

Has precipitated tonic status epilepticus in patients treated for petit mal status or petit mal variant status. Not recommended for OB use.

Efficacy/safety not established in neonates (age 30 days or less); prolonged CNS depression observed. In children, give slowly (up to 0.25 mg/kg over 3 minutes) to avoid apnea or prolonged somnolence; can be repeated after 15 to 30 minutes. If no relief after third administration, appropriate adjunctive therapy is recommended.

Precautions: If combined with other psychotropics or anticonvulsants, carefully consider individual pharmacologic effects—particularly with known compounds which may potentiate action of diazepam, i.e., phenothiazines, narcotics, barbiturates, MAO inhibitors and antidepressants. Protective measures indicated in highly anxious patients with accompanying depression who may have suicidal tendencies. Observe usual precautions in impaired hepatic function; avoid accumulation in patients with compromised kidney function. Limit oral dosage to smallest effective amount in elderly and debilitated to preclude ataxia or over sedation (initially 2 to 2½ mg once or twice daily, increasing gradually as needed and tolerated).

The clearance of diazepam and certain other benzodiazepines can be delayed in association with Tagamet (cimetidine) administration. The clinical significance of this is unclear.

INJECTABLE: Although promptly controlled, seizures may return; readminister if necessary; not recommended for long-term maintenance therapy. Laryngospasm/increased cough reflex are possible during peroral endoscopic procedures; use topical anesthetic, have necessary countermeasures available. Hypotension or muscular weakness possible, particularly when used with narcotics, barbiturates or alcohol. Use lower doses (2 to 5 mg) for elderly/debilitated.

Adverse Reactions: Side effects most commonly reported were drowsiness, fatigue, ataxia. Infrequently encountered were confusion, constipation, depression, diplopia, dysarthria, headache, hypotension, incontinence, jaundice, changes in libido, nausea, changes in salivation, skin rash, slurred speech, tremor, urinary retention, vertigo, blurred vision. Paradoxical reactions such as acute hyperexcited states, anxiety, hallucinations, increased muscle spasticity,

insomnia, rage, sleep disturbances and stimulation have been reported; should these occur, discontinue drug.

Because of isolated reports of neutropenia and jaundice, periodic blood counts, liver function tests advisable during long-term therapy. Minor changes in EEG patterns, usually low-voltage fast activity, observed in patients during and after diazepam therapy are of no known significance.

INJECTABLE: Venous thrombosis/phlebitis at injection site, hypoactivity, syncope, bradycardia, cardiovascular collapse, nystagmus, urticaria, hiccups, neutropenia. In peroral endoscopic procedures, coughing, depressed respiration, dyspnea, hyperventilation, laryngospasm/pain in throat or chest have been reported.

Dosage: Individualize for maximum beneficial effect.

ORAL: **Adults:** Anxiety disorders, relief of symptoms of anxiety—Valium (diazepam/Roche) tablets, 2 to 10 mg b.i.d. to q.i.d.; or 1 or 2 Valrelease capsules (15 to 30 mg) daily. Acute alcohol withdrawal—tablets, 10 mg t.i.d. or q.i.d. in first 24 hours, then 5 mg t.i.d. or q.i.d. as needed; or 2 capsules (30 mg) the first 24 hours, then 1 capsule (15 mg) daily as needed. Adjunctively in skeletal muscle spasm—tablets, 2 to 10 mg t.i.d. or q.i.d.; or 1 or 2 capsules (15 to 30 mg) once daily. Adjunctively in convulsive disorders—tablets, 2 to 10 mg b.i.d. to q.i.d.; or 1 or 2 capsules (15 to 30 mg) once daily.

Geriatric or debilitated patients: Tablets—2 to 2½ mg 1 or 2 times daily initially, increasing as needed and tolerated (see Precautions). Capsules—1 capsule (15 mg) daily when 5 mg oral Valium has been determined as the optimal daily dose.

Children: Tablets—1 to 2½ mg t.i.d. or q.i.d. initially, increasing as needed and tolerated (not for use in children under 6 months). Capsules—1 capsule (15 mg) daily when 5 mg oral Valium has been determined as the optimal daily dose (not for use in children under 6 months).

INJECTABLE: Usual initial dose in older children and adults is 2 to 20 mg I.M. or I.V., depending on indication and severity. Larger doses may be required in some conditions (tetanus). In acute conditions injection may be repeated within 1 hour, although interval of 3 to 4 hours is usually satisfactory. Lower doses (usually 2 to 5 mg) with slow dosage increase for elderly or debilitated patients and when sedative drugs are added. (See Warnings and Adverse Reactions.) For dosages in infants and children see below; have resuscitative facilities available.

I.M. use: by deep injection into the muscle.

I.V. use: inject slowly, take at least one minute for each 5 mg (1 ml) given. Do not use small veins, i.e., dorsum of hand or wrist. Use extreme care to avoid intra-arterial administration or extravasation. Do not mix or dilute Valium with other solutions or drugs in syringe or infusion flask. If it is not feasible to administer Valium directly I.V., it may be injected slowly through the infusion tubing as close as possible to the vein insertion.

Moderate anxiety disorders and symptoms of anxiety, 2 to 5 mg I.M. or I.V., and severe anxiety disorders and symptoms of anxiety, 5 to 10 mg I.M. or I.V., repeat in 3 to 4 hours if necessary; acute alcohol withdrawal, 10 mg I.M. or I.V. initially, then 5 to 10 mg in 3 to 4 hours if necessary. Muscle spasm, in adults, 5 to 10 mg I.M. or I.V. initially, then 5 to 10 mg in 3 to 4 hours if necessary (tetanus may require larger doses); in children administer I.V. slowly; for tetanus in infants over 30 days of age, 1 to 2 mg I.M. or I.V., repeat every 3 to 4 hours if necessary; in children 5 years or older, 5 to 10 mg repeated every 3 to 4 hours as needed. Respiratory assistance should be available.

Status epilepticus, severe recurrent convulsive seizures (I.V. route preferred), 5 to 10 mg adult dose administered slowly, repeat at 10- to 15-minute intervals up to 30 mg maximum. Repeat in 2 to 4 hours if necessary, keeping in mind possibility of residual active metabolites. Use caution in presence of chronic lung disease or unstable cardiovascular status. Infants (over 30 days) and children (under 5 years), 0.2 to 0.5 mg slowly every 2 to 5 min., up to 5 mg (I.V. preferred). Children 5 years plus, 1 mg every 2 to 5 min., up to 10 mg (slow I.V. preferred); repeat in 2 to 4 hours if needed. EEG monitoring may be helpful.

In endoscopic procedures, titrate I.V. dosage to desired sedative response, generally 10 mg or less but up to 20 mg (if narcotics are omitted) immediately prior to procedure; if I.V. cannot be used, 5 to 10 mg I.M. approximately 30 minutes prior to procedure. As preoperative medication, 10 mg I.M.; in cardioversion, 5 to 15 mg I.V. within 5 to 10 minutes prior to procedure. Once acute symptomatology has been properly controlled with injectable form, patient may be placed on oral form if further treatment is required.

Management of Overdosage: Manifestations include somnolence, confusion, coma, diminished reflexes. Monitor respiration, pulse, blood pressure; employ general supportive measures, I.V. fluids, adequate airway. Use levaterenol or metaraminol for hypotension. Dialysis is of limited value.

How Supplied:

ORAL: Valium scored tablets—2 mg, white; 5 mg, yellow; 10 mg, blue—bottles of 100 and 500; Prescription Paks of 50, available in trays of 10; Tel-E-Dose® packages of 100, available in trays of 4 reverse-numbered boxes of 25 and in boxes containing 10 strips of 10.

Valrelease (diazepam/Roche) slow-release capsules—15 mg (yellow and blue), bottles of 100; Prescription Paks of 30.

INJECTABLE: Ampuls, 2 ml, boxes of 10; Vials, 10 ml, boxes of 1; Tel-E-Ject® (disposable syringes), 2 ml, boxes of 10. Each ml contains 5 mg diazepam, compounded with 40% propylene glycol, 10% ethyl alcohol, 5% sodium benzoate and benzoic acid as buffers, and 1.5% benzyl alcohol as preservative.



Rheumatologic Manifestations of Amyloid Disease

STEPHEN HALL, M.D.* and HARVINDER S. LUTHRA, M.D.*

THE AMYLOID DISEASES are a heterogeneous group of disorders in which an insoluble proteinaceous material infiltrates one or several organs. This disease can exist in primary form, associated with dysproteinemias most commonly multiple myeloma or as secondary amyloidosis, usually a long-term sequella to chronic inflammation and infections such as rheumatoid arthritis, osteomyelitis and tuberculosis. The rheumatologic significance of amyloidosis lies in its confusing mimicry of other, more common conditions.

The most common rheumatologic manifestation of amyloidosis is carpal tunnel syndrome caused by amyloid deposits in the tenosynovial tissues deep to the flexor retinaculum. It occurs in more than 20% of cases of amyloidosis and may develop months or years before other evidence of systemic disease. It generally requires surgical decompression and a biopsy of the tenosynovium, if appropriately stained, reveals amyloid deposits. Thus, tissue removed at surgery should be stained for amyloid in all patients with bilateral carpal tunnel syndrome. Rarely, it is possible for the disease to be localized to the carpal tunnel without the development of features of systemic amyloidosis.

Amyloid may deposit along the blood vessels of the synovium and tendon sheaths causing an arthropathy with striking resemblance to rheumatoid arthritis. The clinical picture is one of symmetrical polyarthritis characterized by pain, stiffness and swelling in the small joints of the hands and possibly also in the larger joints such as the shoulders, wrists, elbows and knees. Infiltration of and around the shoulder gives the characteristic "shoulder pad sign". Subcutaneous nodular deposits of amyloid may be seen in association with this arthropathy, often near the olecranon bursa mimicking rheumatoid nodules.

Roentgenograms show osteoporosis and/or bony lytic lesions in 75% of the patients with erosions seen only in 5%. Such lytic lesions usually represent multiple myeloma which is the commonest cause of amyloid arthropathy. Synovial fluid analysis is usually

unremarkable being type I (non-inflammatory) with less than 2000 cells per mm³, predominantly mononuclear. There have been, however, a few observations of amyloid synovial fluid containing up to 10,000 white cells per mm³ with predominantly polymorphonuclear cells. Rheumatoid factor is negative. Examination of the sediment after appropriate staining with congo red and using polarized light microscopy can confirm the diagnosis. Alternatively one needs to perform a synovial biopsy.

Amyloid arthropathy should be suspected when patients present with a seronegative, rheumatoid-like polyarthritis. In addition, presence of subcutaneous nodules without rheumatoid factor should raise suspicion of amyloid arthropathy. This arthropathy responds poorly to conventional treatment with salicylates or other nonsteroidal anti-inflammatory drugs.

The majority of patients with amyloid arthropathy have associated multiple myeloma or, more rarely, Waldenström's macroglobulinemia. One recent study found that 5% of patients with multiple myeloma had a clinically significant amyloid arthropathy, often previously unsuspected, even in the absence of amyloid deposits on rectal biopsy.

Unfortunately, a synovial biopsy positive for amyloid does not, in itself, unequivocally establish the diagnosis of amyloidosis. One-third of patients having joint replacement for osteoarthritis of the hip have amyloid material demonstrable in the capsule of the hip joint. Similarly, amyloid material has been demonstrated in the synovium of patients with pseudogout and psoriatic arthritis. Immunoelectrophoresis of both serum and urine is helpful in the diagnosis of systemic amyloidosis with monoclonal protein found in one or both specimens in 88% with primary amyloidosis and 100% of cases with amyloidosis secondary to multiple myeloma. The diagnosis of systemic amyloidosis will often depend on the associated demonstration of amyloid elsewhere through biopsy of clinically involved organs or examination of bone marrow, rectal tissue or abdominal wall fat aspirate.

Less common manifestations of amyloidosis include the development of "sicca complex" with

*Mayo Clinic, Rochester, Minnesota.

AMYLOID DISEASE — HALL AND LUTHRA

xerostomia and keratoconjunctivitis sicca.

The recognition of the various rheumatologic features of amyloidosis may allow earlier diagnosis of an underlying, treatable multiple myeloma. At this stage, primary amyloidosis has no therapy of proven benefit though prospective studies involving putative

therapeutic agents such as melphalan, are being conducted in a number of referral centers. Furthermore, the recognition of amyloidosis may spare the patient potentially harmful treatments directed at conditions which amyloid may mimic.

Rheumatology Seminar V

March 6-13, 1984

Location: Paradise Grand Hotel, Nassau, BAHAMAS
Dates: Departure from Twin Cities Airport on Tuesday, March 6
Return to Twin Cities on Tuesday, March 13
Educational Program — March 7-11
Fee: \$285 (educational program)
Approximately: \$1,378 per physician/\$324 per accompanying spouse or child (includes round-trip flight, ground transportation and accommodations for seven nights)
Faculty: From the University of Minnesota and the Mayo Clinic
Content: Common rheumatologic problems, diagnosis, treatment and the course of the disease
Hours: 20 hours, Category I/Prescribed
Contact: Department of CME and Meeting Services,
Minnesota Medical Association, Suite 400, 2221 University Avenue SE,
Minneapolis, Minnesota 55414, 612/378-1875.

Children's Hospital — St. Paul

Pediatric Conferences

Oct. 13	"New Trends in the Management of ITP"	John Priest, M.D., Children's Hospital of St. Paul
Oct. 20	"Balloon Dilatation of Congenital Cardiac Defects: A New Approach"	James Lock, M.D., University of Minnesota
Oct. 27	"Diabetes and Nephrotic Syndrome"	Robert Vernier, M.D., University of Minnesota; and Stanley Leonard, M.D., St. Paul

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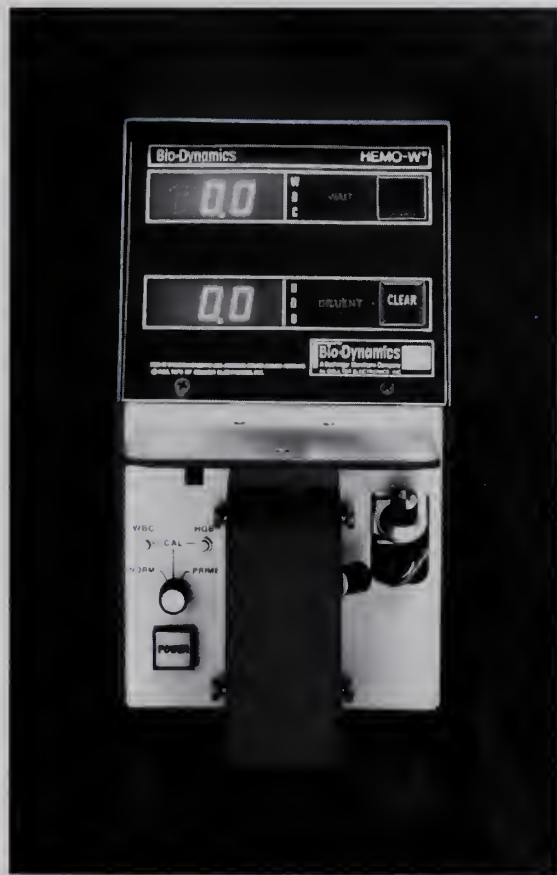
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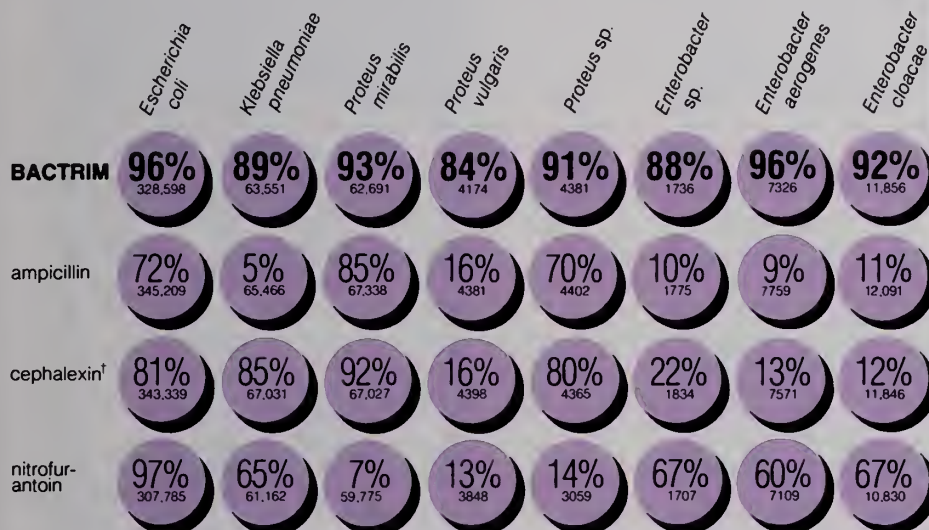
In vitro studies demonstrate



Bactericidal activity

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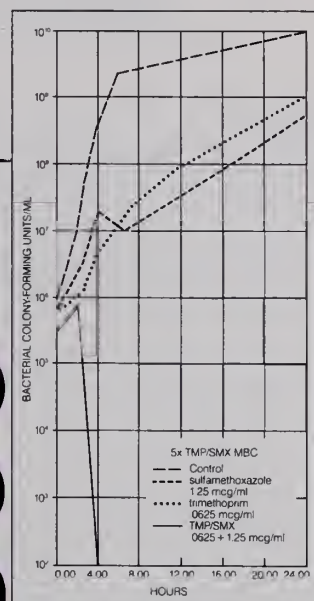
Percent of isolates of common uropathogens sensitive to BACTRIM and to other antimicrobials



*Analogous to cephalothin, the primary antibiotic disc used in testing.

Source: The Bacteriologic Report, BAC-DATA Medical Information Systems, Inc., Winter Series, 1981-82. Numbers under percentages refer to the projected number of isolates tested.

RAPID IN VITRO DESTRUCTION OF *E. COLI**



Kill curve kinetics of Bactrim and its individual components against *E. coli* in vitro.¹

The bactericidal action of Bactrim has been demonstrated *in vitro* on laboratory strains of *E. coli*^{1,2} and on clinical isolates of *E. coli*, *Klebsiella-Enterobacter*, *Proteus mirabilis* and *Morganella morganii*³—the most common causative organisms of urinary tract infections.⁴ More than 100 published studies attest to the efficacy of Bactrim in recurrent urinary tract infections due to these organisms.⁵ In comparative studies with other antimicrobials, Bactrim has consistently demonstrated unsurpassed efficacy during therapy.⁶⁻¹¹

Resistance to Bactrim develops more slowly than to either of its components alone *in vitro*.^{*} Among urinary tract isolates, resistance has rarely emerged in susceptible strains.^{5,12} Bactrim is contraindicated in pregnancy at term, during lactation, in infants less than two months old and in documented megaloblastic anemia due to folate deficiency. Initial episodes of uncomplicated urinary infections should be treated with a single-agent antimicrobial.

Bactrim™ DS

(trimethoprim and sulfamethoxazole/Roche)

b.i.d. for recurrent urinary tract infections

*In vitro data do not necessarily predict clinical results.

References: 1. Data on file, Hoffmann-La Roche Inc., Nutley, NJ. 2. Kramer MJ, Maunz YR, Robertson TL, Timmes MD: Morphological studies on the effect of subinhibitory and inhibitory doses of sulfamethoxazole-trimethoprim combination on *Escherichia coli*. Presented at the 12th International Congress of Chemotherapy, Florence, Italy, Jul 19-24, 1981. 3. Spicehandler J et al: *Rev Infect Dis* 4:562-565, Mar-Apr 1982. 4. Stamey TA: *Pathogenesis and Treatment of Urinary Tract Infections*, Baltimore, Williams & Wilkins, 1980, p. 13. 5. Ronald AR: *Clin Ther* 3:176-189, Mar 1980. 6. Cooper J, Brummitt W, Hamilton-Miller JMT: *J Antimicrob Chemother* 6:231-239, 1980. 7. Gower PE, Tasker PRW: *Br Med J* 1:684-686, Mar 20, 1976. 8. Cosgrove MD, Morrow JW: *J Urol* 111:670-672, May 1974. 9. Iravani A et al: *Antimicrob Agents Chemother* 19:598-604, Apr 1981. 10. Schaeffer AJ, Flynn S, Jones J: *J Urol* 125:825-827, Jun 1981. 11. Rous SN: *J Urol* 125:228-229, Feb 1981. 12. BAC-DATA Medical Information Systems, Inc., Bacteriologic Reports, Winter Series, 1976-82.

Bactrim™ DS

(trimethoprim and sulfamethoxazole/Roche)

Before prescribing, please consult complete product information, a summary of which follows:

Indications and Usage: For the treatment of urinary tract infections due to susceptible strains of the following organisms: *Escherichia coli*, *Klebsiella-Enterobacter*, *Proteus mirabilis*, *Proteus vulgaris*, *Proteus morganii*. It is recommended that initial episodes of uncomplicated urinary tract infections be treated with a single effective antibacterial agent rather than the combination. Note: The increasing frequency of resistant organisms limits the usefulness of all antibacterials, especially in these urinary tract infections.

For acute otitis media in children due to susceptible strains of *Haemophilus influenzae* or *Streptococcus pneumoniae* when in physician's judgment it offers an advantage over other antimicrobials. To date, there are limited data on the safety of repeated use of Bactrim in children under two years of age. Bactrim is not indicated for prophylactic or prolonged administration in otitis media at any age.

For acute exacerbations of chronic bronchitis in adults due to susceptible strains of *Haemophilus influenzae* or *Streptococcus pneumoniae* when in physician's judgment it offers an advantage over a single antimicrobial agent.

For enteritis due to susceptible strains of *Shigella flexneri* and *Shigella sonnei* when antibacterial therapy is indicated.

Also for the treatment of documented *Pneumocystis carinii* pneumonitis.

Contraindications: Hypersensitivity to trimethoprim or sulfonamides; patients with documented megaloblastic anemia due to folate deficiency; pregnancy at term, nursing mothers because sulfonamides are excreted in human milk and may cause kernicterus; infants less than 2 months of age.

Warnings: BACTRIM SHOULD NOT BE USED TO TREAT STREPTOCOCCAL PHARYNGITIS. Clinical studies show that patients with group A β -hemolytic streptococcal tonsillopharyngitis have higher incidence of bacteriologic failure when treated with Bactrim than do those treated with penicillin. Deaths from hypersensitivity reactions, hepatocellular necrosis, agranulocytosis, aplastic anemia and other blood dyscrasias have been associated with sulfonamides. Experience with trimethoprim is much more limited but occasional interference with hematopoiesis has been reported as well as an increased incidence of thrombopenia with purpura in elderly patients on certain diuretics, primarily thiazides. Sore throat, fever, pallor, purpura or jaundice may be early signs of serious blood disorders. Frequent CBC's are recommended; therapy should be discontinued if a significantly reduced count of any formed blood element is noted.

Precautions: General: Use cautiously in patients with impaired renal or hepatic function, possible folate deficiency, severe allergy or bronchial asthma. In patients with glucose-6-phosphate dehydrogenase deficiency, hemolysis, frequently dose-related, may occur. During therapy, maintain adequate fluid intake and perform frequent urinalyses, with careful microscopic examination, and renal function tests, particularly where there is impaired renal function. Bactrim may prolong prothrombin time in those receiving warfarin; reassess coagulation time when administering Bactrim to these patients.

Pregnancy: Teratogenic Effects: Pregnancy Category C. Because trimethoprim and sulfamethoxazole may interfere with folic acid metabolism, use during pregnancy only if potential benefits justify the potential risk to the fetus.

Adverse Reactions: All major reactions to sulfonamides and trimethoprim are included, even if not reported with Bactrim. **Blood dyscrasias:** Agranulocytosis, aplastic anemia, megaloblastic anemia, thrombopenia, leukopenia, hemolytic anemia, purpura, hypoprothrombinemia and methemoglobinemia. **Allergic reactions:** Erythema multiforme, Stevens-Johnson syndrome, generalized skin eruptions, epidermal necrolysis, urticaria, serum sickness, pruritus, exfoliative dermatitis, anaphylactoid reactions, periorbital edema, conjunctival and scleral injection, photosensitization, arthralgia and allergic myocarditis. **Gastrointestinal reactions:** Glossitis, stomatitis, nausea, emesis, abdominal pains, hepatitis, hepatocellular necrosis, diarrhea, pseudomembranous colitis and pancreatitis. **CNS reactions:** Headache, peripheral neuritis, mental depression, convulsions, ataxia, hallucinations, tinnitus, vertigo, insomnia, apathy, fatigue, muscle weakness and nervousness. **Miscellaneous reactions:** Drug fever, chills, toxic nephrosis with oliguria and anuria, periarteritis nodosa and L.E. phenomenon. Due to certain chemical similarities to some goitrogens, diuretics (acetazolamide, thiazides) and oral hypoglycemic agents, sulfonamides have caused rare instances of goiter production, diuresis and hypoglycemia in patients; cross-sensitivity with these agents may exist. In rats, long-term therapy with sulfonamides has produced thyroid malignancies.

Dosage: Not recommended for infants less than two months of age.

URINARY TRACT INFECTIONS AND SHIGELLOSIS IN ADULTS AND CHILDREN, AND ACUTE OTITIS MEDIA IN CHILDREN:

Adults: Usual adult dosage for urinary tract infections—1 DS tablet (double strength), 2 tablets (single strength) or 4 teasp. (20 ml) b.i.d. for 10-14 days. Use identical daily dosage for 5 days for shigellosis.

Children: Recommended dosage for children with urinary tract infections or acute otitis media—8 mg/kg trimethoprim and 40 mg/kg sulfamethoxazole per 24 hours, in two divided doses for 10 days. Use identical daily dosage for 5 days for shigellosis.

For patients with renal impairment: Use recommended dosage regimen when creatinine clearance is above 30 ml/min. If creatinine clearance is between 15 and 30 ml/min, use one-half the usual regimen. Bactrim is not recommended if creatinine clearance is below 15 ml/min.

ACUTE EXACERBATIONS OF CHRONIC BRONCHITIS IN ADULTS:

Usual adult dosage: 1 DS tablet (double strength), 2 tablets (single strength) or 4 teasp. (20 ml) b.i.d. for 14 days.

PNEUMOCYSTIS CARINII PNEUMONITIS:

Recommended dosage: 20 mg/kg trimethoprim and 100 mg/kg sulfamethoxazole per 24 hours in equal doses every 6 hours for 14 days. See complete product information for suggested children's dosage table.

Supplied: Double Strength (DS) tablets, each containing 160 mg trimethoprim and 800 mg sulfamethoxazole, bottles of 100 and 500; Tel-E-Dose® packages of 100; Prescription Paks of 20. Tablets, each containing 80 mg trimethoprim and 400 mg sulfamethoxazole—bottles of 100 and 500; Tel-E-Dose® packages of 100; Prescription Paks of 40. Pediatric Suspension, containing 40 mg trimethoprim and 200 mg sulfamethoxazole per teaspoonful (5 ml); cherry flavored—bottles of 100 ml and 16 oz (1 pint). Suspension, containing 40 mg trimethoprim and 200 mg sulfamethoxazole per tea spoonful (5 ml); fruit-licorice flavored—bottles of 16 oz (1 pint).



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Sports Medicine, Fitness and Nutrition Corner

Principles: Prevention, Rehabilitation, Protection

ROBERT FINKE, R.P.T., A.T.C.*

PARTICIPANTS in athletic activities are subjected to multiple stresses which increase the risk of injury and illness. However, an application of fundamental principles of injury prevention can affect the occurrence and/or severity of injury. The purpose of this article is to discuss these principles and to identify the goals of rehabilitation of injuries; furthermore, to indicate specific methods of providing protection of injuries following rehabilitation. Utilization of the principles presented in this article may assist in preventing, rehabilitating, and protecting injuries in athletics.

Prevention

The most important goal in maintaining the health of athletes is to prevent injuries. This is accomplished by ensuring that athletes participate under the safest conditions relative to their personal physical status and the surrounding environment. A most important factor in injury prevention is common sense¹ exercised by participants, coaches, officials, and parents. In particular, maintaining a comprehensive program for the safety of participants will decrease the likelihood of injury occurrence. Included in such a

program are the following components.

Knowledge of the sport (including its rules, hazards, and proper techniques of participation) is an important factor in prevention that must be recognized by everyone concerned. Specific training in the proper fundamentals of any sport not only improves performance but also enhances safety. In particular, it is essential for physicians to utilize current literature, personal observation, and consultation with experts so that appropriate information can be transmitted to the participants.

Experience in an activity, as a coach or player, may not be associated with low injury rates. More important is current knowledge of prevention and care of injuries.² Even experienced coaches and participants must be informed of the most recent rule changes, equipment, and fundamentals of safe play. Relying on outdated ideas or myths may cause injury and increase liability.

Conduct of an activity is the responsibility of four important groups: (1) athletes must exercise good sportsmanship at all times; (2) coaches are responsible for promoting safe, legal techniques of play and preventing the use of potentially dangerous, or illegal, tactics; (3) governing bodies are responsible for the development of rules designed to prevent serious injuries. Physicians should notify these governing bodies of injuries that occur in order that appropriate rule changes designed to limit the injuries may be initiated;³ (4) game officials are responsible for exercising direct control of contests through proper enforcement of these rules.

Fitness is a particularly valuable factor in the prevention of injury. All steps must be taken to ensure that athletes are medically and physically fit for competition. A medically fit person, that is a person who is of good general health, may not be physically fit for participation in specific sports. For example: a 30 year old former cross country runner who has suffered a work related knee injury may not be a candidate for a 10 kilometer run even though all body functions are normal.

The process of preparing for participation is known as conditioning or training. Hirata⁴ defines good condition as "equal to the neuromuscular demands,

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the necessary strength, and the requisite stamina of the sport." A program designed to prepare athletes for the rigors of an activity should be initiated well in advance of actual competition.

It must be noted that training for an activity is different from practicing that activity. Training is the process of improving or maintaining physical capacity. Practice refers to the repetition of techniques used in the sport concerned so that they may be more effectively executed.¹ The training program, then, is designed to improve muscle strength, muscular and cardiorespiratory endurance, and flexibility of the body; especially body parts under stress in an activity. Thus, the combination of training exercises and their relation to practice must be individualized for each activity. The result is a more finely conditioned athlete who will perform at a higher level with a reduced risk of injury.

A common athletic injury can be cited as an example of the effects of proper conditioning in combination with practice. Baseball pitchers may be prone to shoulder injury, especially early in the season. However, the likelihood of injury to the shoulder is decreased through a weight training program of shoulder strengthening exercises, a flexibility program for the muscles used in throwing, and a gradual increase in throwing speed and length of time throwing (practice).

Good habits of daily living including rest, sleep, and nutrition influence the level of fitness for everyone. Active individuals need adequate time to rest or relax between competition and eating⁵ in addition to proper sleep habits. Nutrition, or diet, has always been an issue for athletes. Because of many popular press articles on this subject, it is important to evaluate the source and reliability of the information. Even reports from well designed research may not be appropriate for the average person or growing athlete since the study populations often do not include these specific groups.

Playing conditions also have a significant influence on the incidence of injury in any activity. Coaches or others supervising activities must be alert to potential hazards. For example, holes or irregularities in football or soccer fields, water or splinters on basketball courts, or unlatched doors leading to the ice surface of hockey rinks must be eliminated. Postponement or changes of location are preferable to any injury that may occur. Furthermore, personnel are responsible for regular inspections and appropriate corrective actions.

Areas adjoining the playing surface must also be free of hazards. Spectators, stands, practice equip-

ment, or other possible hazards must not be close to the playing area. Based on their research, Garrick, Collins, and Requa⁶ recommend a buffer zone of 18 feet around playing fields. Care must be taken to ensure that fences or boards around playing areas do not present a hazard because of protrusions or broken pieces. Many injuries are caused by inappropriate attention to the environment in which activities take place. These injuries are preventable!

Equipment is an important factor in injury prevention. Commonly three factors influence the selection of equipment: (1) safety or protection, (2) cost, and (3) the influence on performance. However, it is important that cost and performance factors are not emphasized to the detriment of safety or protection.⁵ Protective equipment must provide adequate protection to the body under conditions of use. Equipment that is soft, pliable, and light may be desirable; yet not have the ability to withstand the stresses of the activity. Furthermore, since poorly fitted equipment may not only increase the chance for injury but also the severity, attention to this component is essential.

Protective equipment may also be a source of injury for two additional reasons: (1) equipment may give the wearer a false sense of security¹ thus enhancing the potential for injury to himself; (2) equipment may protect the wearer to such an extent that he plays with "reckless abandon" which increases the likelihood of injury to an opponent.⁷ Finally, no piece of equipment can be used which presents an added hazard to other players in the activity such as sharp edges on pieces of protruding metal or protective pads.

Not all protective equipment used in athletics is worn on the body. Gymnastics equipment and wrestling mats are examples of necessary protective equipment. This type of equipment must be properly maintained and meet established specifications at all times.

All equipment must be re-checked regularly throughout the season. Furthermore, a maintenance checklist must be kept to ensure that proper checks and repairs have been made. Following each season a thorough check of equipment must be completed. Damaged equipment must be reconditioned to meet the same standards required of new equipment, and worn out or inadequate items must be discarded.

Balanced competition is cited by O'Donaghue⁵ as a factor in preventing injury. Logically it is unhealthy to ask a small competitor to compete against larger, stronger, more skilled opponents. Many studies are being conducted relative to the psychological

implications of participation in sports under these conditions; the physical implications are apparent. Physicians, coaches, parents, and athletes must be concerned with questions relevant to participation such as: how often, how fast, how hard, what activity, etc. Maintaining a balance in participation is essential in reducing the risk of injury to the athlete.

Finally, the coach, athlete, and parent must examine their attitudes and motivations relative to sports participation. The goals set by these groups must be realistic and compatible. Moreover, these goals must be flexible according to the physical capacities of the participants and their progress in an activity. An important consideration in setting realistic goals includes the fact that pain must not be accepted as a part of athletic participation. The cause of any pain must be analyzed and eliminated. Rest, change of practice routines, or even a change of activity has to be accepted as a logical resolution of injury. Physicians may have to insist that these steps be taken to protect the health of the athlete.

All possible means of prevention must be utilized in assisting athletes to attain the goal of optimal health. The factors that have been identified are most important in attaining this goal while benefitting from the positive aspects of athletic activity.

Rehabilitation

Athletics require maximal effort by participants. Therefore, some risk of injury exists. When an injury occurs a thorough process of evaluation and diagnosis must be performed. Initially, the coach, or certified athletic trainer often has to evaluate the severity of an injury at the site of competition. Based on this evaluation, the injured individual must be cared for properly and referred to a health care professional (emergency room, doctor's office) as necessary for an accurate diagnosis. Serious, potentially life threatening injuries, must be managed. A physician must be consulted to diagnose any injury that is clearly not minor in nature. Use of X-rays and other diagnostic tools may be necessary to determine the extent of injury.

Following an accurate diagnosis of the injury it must be managed properly and fully rehabilitated. The process of rehabilitation can be best accomplished by consultation with qualified personnel including registered physical therapists. However, doctors, coaches, parents and athletes must accept the responsibility to learn and follow proper rehabilitation programs designed for a particular injury.

There are two fundamental objectives of the rehabilitation program: (1) prevention of de-

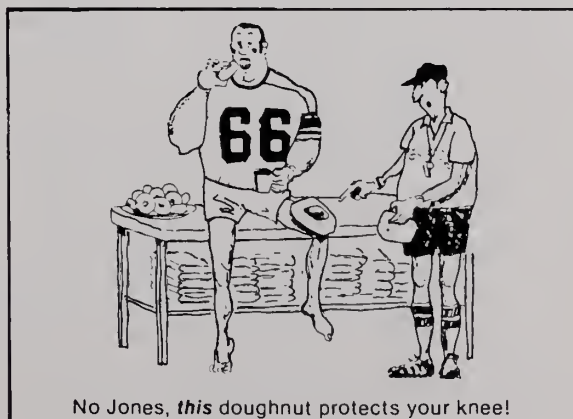
conditioning of the total body, and (2) reconditioning of the injured part without disrupting the healing process.⁸ When these two objectives are met, the athlete is able to resume competition, safely, within a realistic time period.

Physicians must be aware of the motivation of athletes to utilize current methods of rehabilitation. Simply prescribing rest following an injury does not serve the best interests of an injured athlete. All health professionals are responsible for providing optimal care to patients relative to their personal goals.

A rehabilitation program should be monitored by a qualified health professional at all times. Athletes who have suffered multiple injuries or life threatening injuries obviously require specialized care and rehabilitation programs.

To prevent deconditioning of the body the athlete must remain active and physically fit as much as possible. However, the value of rest of the injury cannot be overemphasized during the recovery period. *The injured body part can be rested and exercised within safe limits while the body is kept in condition* if exercises are selected intelligently with respect to the injury site. The athlete should strive to maintain strength, endurance, and flexibility throughout the body. He/she may also be able to pursue skills while not endangering the injury. For example: a hockey player who has injured an arm or shoulder may be able to continue efforts in skating skills with appropriate protection provided for the injured part. Use of stationary bicycles, swimming, and weight training are means of limiting the deconditioning process.

Reconditioning of the injured body part may require a variety of treatments. These include the use of physical therapy modalities such as ice, whirlpool, or different types of heat (hot packs, ultrasound). In addition, a program of proper exercises designed to



improve the motion, strength, endurance, and flexibility of the injured area must be initiated. These exercises will gradually include activities designed to regain or improve functional skills of the injured body area.

The athlete should resume athletic activity gradually. The process must be monitored by a qualified person, such as a physical therapist who is familiar with the injury and the demands of an activity. Progressing too quickly may prevent proper healing and delay return to competition. Full competitive activity must not be resumed until the athlete has met the following criteria:

1. NO PAIN
2. FULL STRENGTH — of injured area and whole body.
3. FULL RANGE OF MOTION — of all body parts.
4. ADEQUATE TIME has been allowed for bone and soft tissue healing.
5. PROPER MENTAL ATTITUDE.

The first three criteria have been discussed earlier. However, the fifth criteria is also integral to the rehabilitation process. All people respond differently to injury. Athletes require understanding and encouragement when returning to action and must have complete confidence in their ability to compete and to perform at maximum capacity.

Protection

Following a complete rehabilitation process an injury may require protective padding or support. It is important that any protective device applied is positioned and fitted properly. Similar to equipment discussed previously, the protective device must protect the injury while not presenting a hazard to the individual or others participating in the sport.

Two major means of protection or support are specially designed pads and adhesive tape. Remember: these devices are to be used only when the goals of rehabilitation (no pain, complete strength and range of motion, and proper mental attitude) have been accomplished.

Designing pads to protect previously injured body areas requires the skill of a person familiar with the injury incurred and the anatomy of the body. Special pads should protect an area from any pressure due to impact while not diverting the impact to an area where another injury may occur. The use of circular,

doughnut-shaped, pads divert pressure from an injured area to uninjured areas around the injury. A horseshoe shaped pad may serve the same purpose. When properly constructed the pad should surround the injured area leaving the injured section in the middle, or hole, of the doughnut. A solid piece of material is used to cover the hole of the doughnut and is attached to the edges of the doughnut. In this manner, any blow to the injury will not strike the body and the pressure will be distributed away from the injury. Once a special pad is developed it must be held securely in place. If the pad moves it may divert impact pressure on to the injured area.

The use of adhesive tape for support is a controversial, yet widely used, method of preventing and protecting injury. Some individuals feel that ankle taping, for example, is a useless ritual¹⁰ that does not prevent injury and may be harmful to other areas of the body. However, others feel that tape can restrict those motions commonly associated with an injury¹¹. Various research has shown that tape applied to any area of the body loses its effectiveness over time especially with exercise. In addition, the tape can be effective only when applied properly; otherwise it may be a hazard. Finally, it is important to repeat that tape is not to be used as a crutch for a part that is not completely rehabilitated.

Other protective or supportive devices include splints and braces. These range from homemade items to expensive molded braces. Regardless of the type of equipment used for support or protection the following goals of protection must be considered:

1. Provide adequate support to the area and thus prevent further injury.
2. Allow the injured player to participate safely and effectively.
3. Protect the opposing players (and teammates).
4. Satisfy the opposing players that the above criteria are met within the rules governing the particular sport.¹¹

The principles of prevention, rehabilitation, and protection are designed to promote safe participation for all athletes. These factors can be followed without altering the purpose or spirit of athletic competition. The physician can play an important role in these areas if he/she is willing to be educated relative to the specifics of biomechanics and injuries in sports and to convey this information throughout the community.

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5-13. Will be found on page 613.

Minnesota Medical Association

Let's Help Our Patients Become Ex-Smokers

THOMAS E. KOTTKE, M.D. MSPH¹

ACCORDING TO a recent study, we physicians can have an impressive impact on the smoking habits of our patients. Geoffrey Rose reported in the *Journal of Epidemiology and Community Health* [1982; 36:102-108] that four messages from a physician over the period of a year resulted in a 75 percent reduction in cigarette consumption. Even after ten years, the reduction in the intervention group was still 50 percent greater than the reduction in the control group. So, in spite of all our misgivings, smokers really do listen to us. But what message should we give, and how should we give it?

The message must be, "Stop Smoking." Cutting down or changing brands simply isn't enough. Kaufman et al., reporting in the *New England Journal of Medicine* [1983; 308:409-413], showed that switching to a low tar and nicotine cigarette doesn't lower the risk of myocardial infarction.

We can give the message indirectly by encouraging a smoke-free environment for the patient, in the hospital, at home, and at work. I tell all my patients and their families that their households should become smoke-free; the cardiac patient's life depends on being able to stop smoking, and stopping smoking depends on being in a smoke-free environment. Many people who work in areas where smoking is prohibited for health or safety reasons stop smoking simply because the stimulus to smoke is removed for

eight hours of the day. Making our own work sites, our offices and hospitals, smoke-free should be of highest priority. After all, we are a health care profession.

As Rose demonstrated, we can give the message by personally encouraging our patients to stop smoking. And until November 17 we can give our patients even more incentive to stop smoking through Minnesota D-day, which this year will feature the QUIT SMOKING BONANZA. Sponsored by the American Lung Association of Minnesota and the American Cancer Society, Minnesota Division, Inc., the QUIT SMOKING BONANZA is open to any confirmed smoker, 18 or older, who lives in Minnesota. The smoker who quits on or before Minnesota D-Day, November 17, 1983, is eligible to win a free vacation or other prizes. An entry form follows this editorial so it can be copied, given to patients, and posted in the office. Have your receptionist or nurse mention the drawing, and tell each of your patients who smoke that you would like them to quit smoking and enter.

Take this opportunity to help your smoking patients: Make your office smoke-free, write a letter to your hospital's chief of staff and administration supporting a smoke-free hospital, and enroll your smoking patients in the Minnesota D-Day QUIT SMOKING BONANZA. It's the least we can do to let our patients in on what we already know — that every smoker can benefit by becoming an ex-smoker.

¹Assistant Professor of Medicine and Public Health, University of Minnesota, Minneapolis, Minnesota.

Physicians in the News

William E. Jacott, M.D., Duluth, a member of the AMA Council on Medical Education and a member of the Minnesota AMA delegation, was elected vice chairman of the AMA Council on Medical Education at the Council's August 26 meeting. Dr. Jacott will be a candidate for his second three year term on the Council at the 1984 AMA House of Delegates in June.

Dr. Milton Orkin is the 1983 Chairman of the Council on the Annual National Meeting of the American Academy of Dermatology; this is the committee which plans the educational and other events of the annual national meeting held in December, usually attracting over 4,000 of its membership.



Everybody's a Winner!

... in the Minnesota D-Day QUIT SMOKING BONANZA

Any time you manage to quit smoking, you're a winner. But if you quit this year for Minnesota D-Day, and make it stick, there may be even more in it for you than better health. You may be able to win a free vacation, or other big prizes, in our quit smoking bonanza.

WHO GETS TO ENTER?

Any confirmed smoker, 18 or older, who lives in Minnesota. Sorry—employees of the American Lung Association and the American Cancer Society, members of the D-Day Committee, and their families, are not eligible.

WHAT DO I HAVE TO DO?

Quit smoking cigarettes—and stop using tobacco and nicotine in any form—on or before Minnesota D-Day, November 17, 1983. Then—stick with it.

HOW WILL YOU PICK THE WINNERS?

On January 11, 1984, we'll hold a drawing to pick our contest finalists. To win, they must be able to prove that they smoked before D-Day, and submit to a chemical test for nicotine or tobacco use. If they still aren't smoking, they're winners—in more ways than one. Final selection of winners will be subject to the judgment of the Minnesota D-Day Committee.

HOW DO I ENTER?

Complete and sign an official entry form, or facsimilie, and mail to:

Minnesota D-Day
614 Portland Ave.
St. Paul, MN 55102

Entries must be postmarked on or before midnight, November 18, 1983.

For complete contest rules, write D-Day Headquarters, 614 Portland Ave., St. Paul 55102. Co-sponsored by the American Lung Association of Minnesota and the American Cancer Society, Minnesota Division.

(detach and mail)

Name _____ Address _____ City _____ Zip _____

Phone _____ Age _____ Sex M F Occupation _____
(include area code) (circle one)

How many cigarettes do/did you smoke each day? (circle) Less than 20 20-40 40-60 Over 60

How long have you smoked? (circle) Less than 1 year 1-5 years 5-10 years
10-20 years Over 20 years

(please sign)

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*Committee on Dietary Allowances, National Research Council:
Recommended Dietary Allowances, ed. 9. Washington, DC, National
Academy of Sciences, 1980, p. 13.

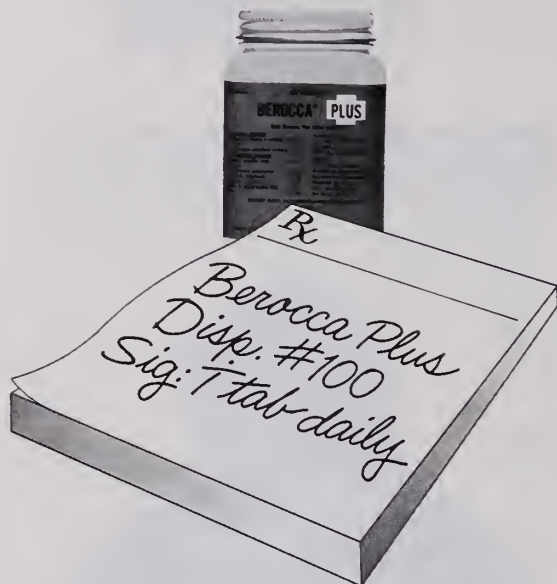
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INDICATIONS: Prophylactic or therapeutic nutritional supplementation in physiologically stressful conditions, including conditions causing depletion, or reduced absorption or bioavailability of essential vitamins and minerals, certain conditions resulting from severe B-vitamin or ascorbic acid deficiency, or conditions resulting in increased needs for essential vitamins and minerals.

CONTRAINDICATIONS: Hypersensitivity to any component.

WARNINGS: Not for pernicious anemia or other megaloblastic anemias where vitamin B₁₂ is deficient. Neurologic involvement may develop or progress, despite temporary remission of anemia, in patients with vitamin B₁₂ deficiency who receive supplemental folic acid and who are inadequately treated with B₁₂.

PRECAUTIONS: General: Certain conditions may require additional nutritional supplementation. During pregnancy, supplementation with vitamin D and calcium may be required. Not intended for treatment of severe specific deficiencies. *Information for the Patient:* Toxic reactions have been reported with injudicious use of certain vitamins and minerals. Urge patients to follow specific dosage instructions. Keep out of reach of children. *Drug and Treatment Interactions:* As little as 5 mg pyridoxine daily can decrease the efficacy of levodopa in the treatment of parkinsonism. Not recommended for patients undergoing such therapy.

ADVERSE REACTIONS: Adverse reactions have been reported with specific vitamins and minerals, but generally at levels substantially higher than those in Berocca Plus. However, allergic and idiosyncratic reactions are possible at lower levels. Iron, even at the usual recommended levels, has been associated with gastrointestinal intolerance in some patients.

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HOW SUPPLIED: Golden yellow, capsule-shaped tablets — bottles of 100.



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Book Review

Chusid JG: Correlative Neuroanatomy and Functional Neurology 18th Edition, Lange Medical Publications, Los Altos, 1982

It is truly a delight to see a new edition of this extraordinarily valuable book. It is designed as a study guide, and, as such, provides a comprehensive review of neuroanatomy, neurophysiology and other aspects of neurologic function and diagnosis. The illustrations, charts and tables are clear, pertinent, and packed with information. As intended, they supplement admirably other texts in the clinical neurosciences. The success of this book is underscored by the fact that there are 7 foreign language editions. The current 18th edition is up to date, and contains good examples of the latest in CT scan and electrodiagnosis. A few anachronisms from earlier editions persist, but they do not detract from the essential value of the book for students and practitioners alike. The publishers have had the good sense to continue to produce this work as an inexpensive paperbound volume, and it should remain as popular in the future as it has been in the past.

Edward R. Laws, Jr., M.D.
Mayo Medical School, Mayo Clinic
Rochester, Minnesota

Sensorineural Hearing Loss, Vertigo and Tinnitus, Vol. I, Ear Clinic International. Edited by Michael M. Paparella and William L. Meyerhoff

This volume contains the contents of a symposium on sensorineural hearing loss conducted in Minneapolis. The first symposium celebrated the dedication of the Lion's International Hearing Center as part of the Department of Otolaryngology of the University of Minnesota. The problems discussed are trends in audiology and future needs in audiology, how diagnosis affects the management of various forms of sensorineural hearing loss, the treatment of the hearing impaired by amplification, the management and observations on tinnitus and then finally several chapters on vestibular problems.

All of the articles are by the known experts in the field and most of them are compilations of their previous publications. It is difficult to define any truly original material in this collection of monographs. Several of the areas, particularly management of the tinnitus patient and allergy and surgical treatment of vertigo, are controversial subjects. The many sides of the controversies are not always touched on. This is particularly true of the surgical treatment of vertigo. The scope of the book is such that it would appeal primarily to the student of otology who is far enough along in his training to appreciate the controversial nature of some of the subjects included and has the perspective to interpret the various sections.

Lawrence W. DeSanto, M.D.
Mayo Clinic
Rochester, Minnesota

Minnesota Medical Association

Meeting the Challenge of Competition in Medicine

LAURA K. GRYGAR
Director of Marketing

IN MAY, the House of Delegates approved a resolution calling for the development of a marketing services program to serve all member physicians of the Minnesota Medical Association.

Minnesota, A Leader

By introducing such a far-sighted initiative to the membership, MMA has responded to dramatic changes which are reshaping the face of medical practice in this country. Nowhere is this occurring with more speed and diversity than in Minnesota. Long known for their innovative leadership role in providing quality health care, Minnesota physicians and health care facilities have been quick to begin the complex process of sorting out a sometimes confusing set of options, toward the goal of providing the best health care possible on an equitable basis to all Minnesotans. The proposal also formalizes the unique role of the Minnesota Medical Association as an expanded resource for service, counsel, and guidance to physicians in this new era of competition.

Clearly, these are days of almost unprecedented change in many sectors of our personal and professional lives, and certainly this is the spirit in which the association assumes this new role of service to the membership. It is a role which has stretched and challenged Association staff members. It has also mandated the addition of other staff members to coordinate new functions which will provide important new services to MMA members this year.

New Theme — Diversity Means Strength

This federation of physicians and staff who make up several MMA committees involved in charting new directions are cognizant of one important change within the membership, which is representative of the state's medical community. The membership now represents a highly diverse set of attitudes and experiences which are the result of the various delivery systems represented. This presents a challenge to staff and members alike.

From the vantage point of services, you can expect and will receive a more diverse set of programs addressing the growing list of concerns you face on a daily basis. Also, this would mean that some programs and services may be offered which are not

tailored to your particular situation. It would mean that you'll be offered some program options and services that may not have been important in the past, but will now be pivotal to your practice.

MMA is Changing to Serve You

How specifically will the Minnesota Medical Association serve you in the future? And how will your daily role likely change in a competitive health care system?

The answer in large part is *marketing*. The Association and a new corporation which is being established to meet your needs will be driven by the results of a market survey of the membership to be taken this fall. Results of this survey will provide invaluable information about the face of medical practice in the state and give examples of innovative techniques which are being used by your peers to change their practice where indicated to meet the changing needs and desires of the patients they serve.

Simplified to its most basic definition, marketing is the process of determining the wants and needs of an audience and tailoring a product or service to those criteria. In this case, the service is a physician's consultation and treatment, and the audience is the patient group he or she serves. Physicians who deal regularly with matters of public health policy will expand this audience definition to include whole communities, states, or nations. The audience may change if a physician plays several roles in the daily routine.

It is important to realize that marketing is not slick advertising and promotion which can be very costly to the physician. These are by-products of market research and planning and are just two of many tools that you will have at your disposal. They are part of the third component of the marketing process which includes:

- Product
- Price
- Promotion
- Place/Accessibility

MMA wishes to educate the membership about marketing. Several seminars will be offered by the Association in the coming months, and the subject will be explored in upcoming issues of MMA pub-

lications. Individual market analysis and related consulting will be available, using professionals who have been screened by the Association and who have demonstrated an understanding of the special nature of health care marketing. It is our intention to make you aware and cautious of costly proposals you may receive which promise quick results and a stream of new patients to your practice.

Introducing Minnesota Medical Services Corporation

In line with the resolution adopted by the House of Delegates, a full complement of services will be developed through MMA and a new corporation, Minnesota Medical Services Corporation (MMS). The two organizations will complement each other and serve the membership with a wide range of educational and consultative services, including:

- A data base of critical data about the practice of medicine in Minnesota (MMA).

- A multi-faceted communications program which effectively educates Minnesota about the role of physicians in building and maintaining an unequalled record of quality health care (MMA).
- Activities designed to assist physicians to function more effectively in a competitive health care marketplace, including contract evaluation services, product design, point-of-purchase presentations, services to hospital medical staffs, and assistance to traditional types of health insurance programs (MMS).
- A range of marketing and practice management services, including computerized billing, accounting and information systems, physician placement services and marketing consultation (MMS).

These are exciting and thought-provoking times in medicine, and we're pleased to be in partnership with you to meet the challenges which are ahead of us.

X-Ray Machine Operators Workshops

The workshops feature two courses, both designed primarily for x-ray machine operators who are not radiologic technologists. Course II is for those who have taken Course I or who attended the workshop the first time it was offered in 1980-81.

Both courses will be taught October 29 at the Park-Nicollet Medical Center, (formerly the St. Louis Park Medical Center) 5000 W. 39th Street, Minneapolis.

The workshop aims to increase the operator's knowledge in radiation risks, and safety measures, exposure techniques, positioning techniques, radiation physics, and film processing. The format includes lectures, audio-visuals, and a question and answer time.

This year's fee of \$75 covers course materials, lunch and refreshments for the workshop, which runs from 8:00 am until 4:15 pm.

Workshop sponsors are: the Minnesota Academy of Family Physicians, the Minnesota Medical Association, the Minnesota Radiological Society, the Minnesota Society of the American Association of Medical Assistants, and the Minnesota Society of Radiologic Technologists.

Registration forms and further information may be obtained by contacting Nancy Daley, workshop administrator, at (612) 623-9559.

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Dear Doctor:

Over 2000 of your fellow physicians have already joined the Minnesota Medical Insurance Exchange in order to obtain professional liability insurance. MMIE now insures approximately 50% of the eligible physicians.

In addition to insuring individuals, the Exchange also provides coverage to many clinics. For example, the Exchange currently insures the physicians of the St. Louis Park Medical Center, the Minneapolis Clinic of Psychiatry and Neurology, the Nicollet Clinic, the Willmar Medical Center, the Mankato Clinic, the East Range Clinics, Anesthesia Associates of Minneapolis, the Columbia Park Medical Group, the Coon Rapids Clinic and the Winona Clinic, among others.

Whether practicing on their own or as part of a clinic, the physicians have joined because physicians are the policymakers of the Exchange, the Exchange has a sound risk management program, the Exchange has a solid reinsurance program and the Exchange offers attractive rates.

For these reasons, we encourage you to give the Exchange your careful consideration. If you have any questions, desire additional information or would like to join the Exchange, please call 800/462-5326 or 612/623-1132.

Sincerely,



Robert S. Flom, M.D.
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Minnesota Medical Association

CME in Minnesota

Provided through the Medical Education Subcommittee on CME Resources

For assistance with scheduling meetings, please contact the MMA office (address and phone given below) for information on future medical meetings and CME courses at the state and national level.

Information for each entry is arranged as follows: Date: Name of program: Primary sponsor: Location: Contact person.

October, 1983

5-7 Internal Medicine Review (10th Annual Course); U of M, Mayo Memorial Auditorium CONTACT: CME, U of M, Box 293 Mayo Memorial Building, 420 Delaware Street, S.E., Minneapolis, MN 55455; 612/373-8012

5, 11, 12 Basic Life Support Instructor Program; Methodist Hospital; Methodist Hospital; CONTACT: Mary Ann Kempcke, Methodist Hospital, 6500 Excelsior Blvd., P.O. Box 650, Minneapolis, MN 55440; 612/932-5167.

8 Current Trend in Ophthalmology — 7th Annual; Mount Sinai Hospital, Minneapolis; CONTACT: Evelyn Peterson, Medical Staff Office, Mount Sinai Hospital, 2215 Park Avenue, Minneapolis, MN 55404; 612/871-3700 ext. 1117.

12-15 Principles of Colon & Rectal Surgery; U of M; Mayo Memorial Auditorium, U of M; Mayo Memorial Auditorium, U of M; CONTACT: CME, U of M, Box 293 Mayo Memorial Building, 420 Delaware Street, SE, Minneapolis, MN 55455; 612/373-8012.

13-22 Advanced Cardiac Life Support Course; Methodist Hospital; Methodist Hospital; CONTACT: Joan Peterson, M.D. Methodist Hospital, 6500 Excelsior Blvd., P.O. Box 650, Minneapolis, MN 55440; 612/932-5419.

14 Annual John R. Sebald Memorial Symposium — Arthritis of the Upper Extremity; Bethesda Lutheran Medical Center & Metropolitan Hand Surgery Asso. P.A.; College of St. Thomas, O'Shaughnessy Education Center; CONTACT: Rose Baumann, Metropolitan Hand Surgery Asso. P.A., 280 North Smith Avenue, Room 840, St. Paul, MN 55102; 612/291-8773.

14 Cardiovascular Disease; U of M; CONTACT: CME, U of M, Box 293 Mayo Memorial Building, 420 Delaware St., S.E., Minneapolis, MN 55455; 612/373-8012.

14-15 5th Adolescent Medicine & Health Conference; U of M; Earle Brown Center, U of M; CONTACT: CME, U of M, Box 293 Mayo Memorial Building, 420 Delaware Street, S.E., Minneapolis, MN 55455; 612/373-8012.

14-16 Midwest Allergy Forum; Minnesota Allergy Society, Hyatt Regency, Minneapolis; CONTACT: Dr. Paul Steinberg, 5000 W. 39th Street, Minneapolis, MN 55416; 612/297-3091.

15 Annual Meeting of MN Chapter of American College of Physicians; Hyatt Regency, Minneapolis; CONTACT: Tom G. Bergstrom, M.D., 750 South Broadway, Cokato, MN 55321.

17-19 Recent Advances in Cardiac Catheterization; Mayo Clinic; Rochester; CONTACT: Postgraduate Courses, Mayo Clinic, 200 1st St. S.W., Rochester, MN 55905, 507/284-2085.

18 Antibiotic Update; Central Mesabi Medical Center; Central Mesabi Medical Center; CONTACT: Ben P. Owens, M.D., Mesaba Clinic, Hibbing, MN 55746; 218/262-3441.

19-21 Second Annual Course; Emergency Medicine for Primary Care Physicians; St. Paul-Ramsey Medical Center; St. Paul Hotel; CONTACT: Ruth McIntyre, St. Paul-Ramsey Medical Center, 650 Jackson Street, St. Paul, MN 55101; 612 221-3992.

20-21 Practice Management Seminars; Minnesota Medical Association, Hennepin County Medical Society and Ramsey County Medical Society; The Registry Hotel; CONTACT: Eugenia C. Kassir, Suite 400, 2221 University Avenue S.E., Minneapolis, MN 55414; 612/378-1875.

20-22 17th Annual Orthopedic and Trauma Seminar; Hennepin County Medical Center; Hennepin County Medical Center — Pillsbury Auditorium; CONTACT: Ramon B. Gustilo, M.D., 701 Park Avenue South, HCMC Orthopedic Office 813, Minneapolis, MN 55415; 612/347-2812.

20-22 9th Annual Meeting — MN Chapter of the Great Plains Organization for Perinatal Health Care; MN Chapter — Great Plains Organization for Perinatal Health; Holiday Inn Downtown, Mankato; CONTACT: Kimberly Bardis, Regional Coordinator, Box 50, 420 Delaware Street, SE, Minneapolis, MN 55455; 612/373-5718.

22 Emergency Medicine for Primary Care Physicians; St. Paul-Ramsey Medical Center CME, The Saint Paul Hotel; CONTACT: Ruth McIntyre, CME, St. Paul-Ramsey Medical Center, 640 Jackson Street, St. Paul, MN 55101; 612/221-3980.

23 Update in Cardiology; Mayo Clinic; Rochester; CONTACT: Postgraduate Courses, Mayo Clinic, 200 1st Street S.W., Rochester, MN 55905; 507/284-2085.

24-26 Clinical Reviews; Mayo Clinic; Rochester; CONTACT: Postgraduate Courses, Mayo Clinic, 200 1st Street, S.W., Rochester, MN 55905; 507/284-2085.

27-28 Medical Management of Disability Claims; U of M; Radisson South, Bloomington; CONTACT: CME, U of M, Box 293, Mayo Memorial Building, 420 Delaware Street, S.E., Minneapolis, MN 55455; 612/373-8012.

28-29 Current Clinical Cardiology; United Hospitals Inc.; Landmark Center, St. Paul; CONTACT: Eleanor Waldrop, United Hospitals, 333 North Smith Avenue, St. Paul, MN 55102; 612/298-8558.

29 Child Abuse & Neglect Seminar; Extension Classes, University of Minnesota; Student Center Theatre, St. Paul Campus; CONTACT: Cyndy Brinkman, 202 Westbrook, 77 Pleasant Street S.E., Minneapolis, MN 55455; 612/373-3039.

(October continued)

29 Cancer 1983 for the Primary Care Physician — Diagnosis and Management of Breast and Colorectal Carcinoma; Section of Hematology/ Medical Oncology Department of Surgery, Hennepin County Medical Society; Pillsbury Auditorium, HCMC; CONTACT: Chris Gielcowski, HCMC, 701 Park Avenue South, Minneapolis, MN 55415; 612/347-2703.

November, 1983

3 John I. Coe Symposium — Computers in Anatomic Pathology and Newer Immunodiagnostic Techniques; U of M; Hennepin County Medical Center; CONTACT: John T. Crosson, M.D., 701 Park Avenue, Minneapolis, MN 55447; 612/347/3010

3-4 Society of Shoulder & Elbow Surgeons; Mayo Clinic, Rochester; Postgraduate Courses, Mayo Clinic, 200 1st Street S.W., Rochester, MN 55905; 507/284-2085.

4 Head & Neck Pathology — E. T. Bell Annual Pathology Symposium; U of M, Minneapolis; CONTACT: CME, U of M, Box 293 Mayo Memorial Building, 420 Delaware St. S.E., Minneapolis, MN 55455; 612/373-8012.

4 Semi-Annual Meeting, MN Surgical Society; Minneapolis, MN; CONTACT: Charles L. Barbee, M.D., 1000 E. 1st St., Ste. 203, Duluth, MN 55805; 218/727-7259.

5 Fall Seminar — Minnesota Society of Clinical Pathologists; Phillips Wangenstein, University of Minnesota; CONTACT: Eugenia Kassar, 2221 University Avenue, S.E., Suite 400, Minneapolis, MN 55414; 612/378-1875.

5 Minnesota Society of Anesthesiologists — Fall Meeting; L'hotel Sofitel, Minneapolis; CONTACT: David E. Byer, M.D., 200 1st Street S.W., Rochester, MN 55901.

6 ENT for Primary Care Physicians; Mayo Clinic Rochester; CONTACT: Postgraduate Courses, Mayo Clinic, 200 1st Street, S.W., Rochester, MN 55905 507/284-2085.

7 Problems in OB/GYN and Endocrinology; The Duluth Clinic; St. Mary's Hospital Auditorium; CONTACT: James Brueggemann, M.D., The Duluth Clinic, Ltd., 400 E. 3rd Street, Duluth, MN 55805; 218/722-8364.

7-9 Clinical Reviews; Mayo Clinic Rochester; CONTACT: Postgraduate Courses, Mayo Clinic, 200 1st Street, S.W., Rochester, MN 55905; 507/284-2085.

9-10 Behavioral Medicine; University of Minnesota; Mayo Memorial Auditorium, U of M; CONTACT: CME, U of M, Box 293 Mayo Memorial Building, 420 Delaware Street S.E., Minneapolis, MN 55455; 612/373-8012.

10-12 Clinical Strategies in Primary Care Medicine; St. Paul-Ramsey Medical Center & University of Minnesota Medical School; The Saint Paul Hotel; CONTACT: Ruth McIntyre, 640 Jackson Street, St. Paul, MN 55101; 612/221-3992.

11 Joint SPRMC Medical Staff Meeting and Research Conference; St. Paul-Ramsey Medical Center; Radisson Plaza; CONTACT: Ruth McIntyre, 640 Jackson Street, St. Paul, MN 55101; 612/221-3992.

11 Problems in Gynecology and Endocrinology; The Duluth Clinic Ltd.; St. Mary's Hospital Auditorium; CONTACT: J. G. Brueggemann, M.D., The Duluth Clinic Ltd., 400 East 3rd Street, Duluth, MN 55805; 218/722-8364.

11-12 4th Annual Seminar for CME Directors; Minnesota Medical Association; Spring Hill Center, Wayzata; CONTACT: Eugenia C. Kassar, Suite 400, 2221 University Avenue S.E., Minneapolis, MN 55414; 612/378-1875.

12 Challenge of Prevention: Health Promotion for Children and Youth; University of Minnesota Extension Classes; 33 McNeal Hall, St. Paul Campus; CONTACT: Cyndy Brinkman, 202 Westbrook Hall, 77 Pleasant Street S.E., Minneapolis, MN 55455; 612/373-3039.

16 Metabolism (Diabetes); Central Mesabi Medical Center; Multipurpose rooms, CMMC; CONTACT: Ben P. Owens, M.D., Mesaba Clinic, Hibbing, MN 55746; 218/262-3441.

17 Education in Preventive Oncology; University of Minnesota Medical School; CME; Sheraton-Ritz Hotel; CONTACT: Bart W. Galle, Ph.D., Interim Director, University of Minnesota; 612/373-8012.

19-20 Endourology: Percutaneous Access to Urinary Tract; University of Minnesota Medical School; CME; Moos Health Sciences Tower, U of M; CONTACT: Bart Galle, Ph.D., Interim Director, CME U of M, Box 293 Mayo Memorial Building, 420 Delaware Street S.E., Minneapolis, MN 55455; 612/373-8012.

27-29 Coronary Heart Disease Workshop; University of Minnesota; Spring Hill Center, Wayzata; CONTACT: CME, University of Minnesota, Box 293 Mayo Memorial Building, 420 Delaware Street S.E., Minneapolis, MN 55455; 612/373-8012.

28-29 Basic Life Support Course; Methodist Hospital; Methodist Hospital; CONTACT: Janell Haugen, Methodist Hospital, 6500 Excelsior Boulevard, P.O. Box 650, Minneapolis, MN 55440; 612/932-5189.

29-30 & December 1

Advanced Cardiac Life Support Course; North Memorial Medical Center; NMMC; CONTACT: William Nelson, 3300 Oakdale North, Robbinsdale, MN 55422; 612/520-5200.

December, 1983

3 Frontiers in Medicine; St. Joseph's Hospital, St. Paul-Ramsey Medical Center & U of M Medical School; St. Joseph's Hospital; CONTACT: Charles Drage, M.D., 69 West Exchange, St. Paul, MN 55102; 612/291-3180.

January, 1984

18-20 Telemark Cancer Conference; The Duluth Clinic, Ltd. — Marshfield Clinic; Telemark Lodge; CONTACT: James Brueggemann, M.D., The Duluth Clinic, Ltd., 400 East 3rd Street, Duluth, MN 55805; 218/722-8364.

For further information on *future* CME programs, contact CME and Meeting Services, Minnesota Medical Association, 2221 University Ave. SE, Suite 400, Minneapolis, MN 55414, 612/378-1875.

MINNESOTA MEDICAL INSURANCE EXCHANGE: MALPRACTICE CLAIMS CONTROL

MMIE Risk Management Committee

Frank E. Johnson, M.D.

Risk Management Programs: Ob-Perinatal Subcommittee and Contact Physicians

The Risk Management Committee and staff of MMIE are continually working to develop innovative, effective approaches to malpractice claims prevention and bring them to the attention of our insured physicians. Two recently implemented programs will provide new opportunities for direct Risk Management contacts with many more of MMIE's insureds:

Obstetrical-Perinatal Risk Management Subcommittee

Nationwide, the frequency and severity of malpractice claims involving birth-related injuries to infants are increasing at dramatic rates. In response to this problem, MMIE has established a risk management subcommittee to address claims-prevention issues of particular relevance to labor and delivery practices. The subcommittee, chaired by Charles J. McCarthy, M.D., is composed of attorneys and specialists in Ob-Gyn and Family Practice from both urban and rural areas of the state. Their work is emphasizing four primary objectives: 1) collection of data to quantify the extent of the problem; 2) education of physicians about the legal and medical issues involved in birth-related claims; 3) evaluation of possible legislative tort reforms affecting medical malpractice; and 4) exploration of potential underwriting measures dealing with OB practices.

The subcommittee has been actively gathering and presenting pertinent material since its formation in October, 1982. Educational programs have been presented for the Spring Refresher of the Minnesota Academy of Family Physicians and the annual meeting of the Great Plains Organization for Perinatal Health Care. The subcommittee is also arranging presentations by physicians, attorneys, and MMIE staff at district meetings of the Academy of Family Physicians.

Claims alleging negligence in obstetrical and perinatal care have been identified as one of the most significant malpractice problems facing the medical profession today. MMIE hopes that the efforts of the OB-Perinatal

Risk Management subcommittee will help control the incidence of birth-related malpractice claims before they reach crisis proportions in Minnesota.

Contact Physician Program

Since its inception, MMIE has operated on the belief that the active participation of physicians is crucial for success in reducing malpractice insurance expenses. In order to take fullest advantage of our insureds' willingness to participate, the Risk Management department has recently begun establishing a network of "contact physicians" in our insured clinics of five or more doctors.

The primary function of the contact physician will be to act as a liaison to MMIE on claims handling and risk management issues. In this capacity, the contact physician will work with the clinic administrator to assist MMIE's staff in evaluating the medical aspects of malpractice claims involving the clinic, identifying potential liability problems the clinic may face, and managing any other claims or claims-prevention problems on which medical expertise is needed. The contact physician will also receive pertinent claims and risk management information from MMIE to share with other physicians at the clinic.

The contact physician will be utilized on an "as needed" basis by MMIE; there will be no extensive commitment of time required to serve in this role. If, however, the members of the medical group are interested in a more in-depth risk management effort, MMIE staff will work with the contact physician to develop and implement a program to meet the needs of the particular clinic.

The contact physician program is designed to help achieve the principal goal of a physician-owned insurer: physician involvement in malpractice claims handling and prevention. We feel that a direct line of communication with our insured clinics is the best means of assuring high quality, individualized claims and risk management representation.

Classified Advertisements

Classified advertising rates are forty (40) cents a word; minimum monthly charge \$10.00, key number, \$2.00 additional. Replies to advertisements with key numbers should be mailed in care of Minnesota Medicine, 2221 University Ave. S.E., #400, Minneapolis 55414.

Placement of ads by telephone not accepted. We also reserve the right to decline or withdraw advertisements at our discretion. Every care is taken to avoid mistakes but responsibility cannot be accepted for clerical or printers errors.

Cancellation of ads must be made before the 10th of the preceding month's issue.

The Journal is not permitted to divulge the identity of advertisers who have replies sent to box numbers.

GENERAL SURGEON, board certified or eligible, to join 15 doctor multi-specialty clinic in New Ulm, 90 minutes from Twin City metro area. Group includes emergency medicine, family practice, internal medicine, obstetrics and gynecology, orthopedics, pediatrics and general surgery. Associates include oncology, otolaryngology, pathology, radiology and urology. Contact Harold Fenske, administrator, collect — (507) 354-4101.

PSYCHIATRIST to join progressive multi-specialty group of 40+ physicians. Pleasant, growing community. Many outdoor recreational opportunities. High quality of life. Referral area: 150,000. Liberal financial benefits. Send curriculum vitae and references to ATTN. H.P. Hinderaker, M.D., 101 Willmar Avenue, Willmar, MN 56201.

OPPORTUNITY FOR qualified physicians at the Albert Lea Clinic, P. A., in Albert Lea, Minnesota. The clinic is a seventeen man multi-specialty group in primary and secondary care fields. The financial rewards are exceptional and practice challenges very attractive. There is a negotiated salary at top level for the first year. Senior physician participation begins at the end of the first year with a incentive income distribution plan plus expanded fringe benefits. The clinic has a low cost buy in with a maximum profit sharing plan. There is a top level insurance program, medical reimbursement program, and a full range of other benefits. A nearly new hospital in the city provides an exceptional place to work. These are choice practices in a delightful place to live. We are currently looking for physicians in Family Practice, in Otolaryngology, one OB-GYN. Please contact B. J. Boss, Administrator, Albert Lea Clinic, P. A., 1602 Fountain Street, Albert Lea, MN 56007. Phone 507-373-8251. Personal phone 507-377-1406 or contact L. E. Shelhamer, Jr., M.D., 507-373-8251 or personal phone 507-377-1530.

OFFICE SPACE FOR RENT: Physician in Loring Park area of Minneapolis wishes to rent part of his office to another Doctor. Six exam rooms, x-ray, lab, proctable, etc. Adjacent to hospital. Call 612-870-8448.

FAMILY PHYSICIAN FOR PROGRESSIVE RURAL MINNESOTA CLINIC. New and superbly-equipped facility. A pleasant farming community in a physician shortage area, yet only 25 minutes from a metro area. A comfortable call schedule at nearby hospital. Gateway to Minnesota's famous lake country. Young and growing practice with excellent salary and benefits, ownership potential. Must be board-eligible. Call or write to Mr. David A. Nelson or Faris Keeling, M.D. at 218-354-2111 or write to Barnesville Area Clinic, P.O. Box 521, Barnesville, MN 56514.

GENERAL SURGEON AND/OR OB/GYN SURGEON to join 10 doctor multi-specialty group in Owatonna, a community of 18,500 located 68 miles south of the Twin Cities and 42 west of Rochester. Present staff consists of 7 family practitioners, 2 internists, and 1 general surgeon. Other specialties in the community and a close working relationship with the Mayo Clinic, the University of Minnesota hospitals, and other metropolitan centers provide for excellent consultations. Guaranteed salary first year with incentive program thereafter. Group Health, disability, life and accident insurance, retirement profit sharing, and automobiles provided by corporation. Contact: J. D. Miller, M.D. or James Wilkus, Administrator, Owatonna Clinic, P.A., 134 Southview, Owatonna, MN 55060. Telephone (507) 451-1120.

WANTED: Ob-Gyn, family practitioner, pediatrician and internal medicine to join multi-specialty group. One month vacation, hunting, fishing and lake recreation area. Starting salary excellent, many fringe benefits included. Write: MINNESOTA MEDICINE (735), 2221 University Ave. SE, Suite 400, Minneapolis 55414.

Classified Advertisements

1984 CME CRUISE/CONFERENCES ON LEGAL-MEDICAL ISSUES — Caribbean, Mexican, Hawaiian, Alaskan, Mediterranean. 7-14 days in Winter, Spring, Summer. Approved for 18-24 CME Cat. 1 credits (AMA/PRA). Distinguished professors. FLY ROUNDTRIP FREE ON CARIBBEAN, MEXICAN, & ALASKAN CRUISES. Excellent group fares on finest ships. Registration limited. Prescheduled in compliance with present IRS requirements. Information: International Conferences, 189 Lodge Ave., Huntington Station, N.Y. 11746. (516) 549-0869.

FAMILY PHYSICIAN, board eligible, to join group of six Board Certified Family Practitioners and one Board Certified General Surgeon in Blue Earth, Minnesota. \$45,000.00 plus incentive bonus first year with full membership after first year. 4,000 population with practice area of 25,000 in South Central Minnesota. Economy is stable agricultural plus small clean industries. Connected hospital and clinic enlargements now under construction. Complete ancillary support including anesthesiology, radiology, pathology, etc. Contact Marjeane Werner, Clinic Administrator or Dr. Thomas E. Watts, Business Phone: (507) 625-7371. Blue Earth Medical Center, Ltd., 520 South Galbraith, Blue Earth, MN 56013.

OB GYN to join successful 12 physician practice in Faribault, MN, just 50 miles south of Mpls. on 35 W. 2 general surgeons, 2 internists, 8 family physicians. Busy OB practice. Newly remodeled clinic 5 blocks from modern well-equipped hospital. Guaranteed salary first year, incentive compensation thereafter. Disability, Life, Health, Malpractice insurance paid by the clinic. Profit sharing and pension plan as well as generous vacation and study time. Contact Darral Mischke, Administrator, Faribault Clinic, Ltd., 924 N.E. 1st St., Faribault, MN 55021. Telephone: 507-334-3921.

DERMATOLOGIST. Board certified/eligible to join progressive multi-specialty group of 40+ physicians. Pleasant growing community. Many outdoor recreational opportunities. High quality of life. Referral area, 150,000. Liberal financial benefits. Send curriculum vitae and references, ATTN: M. T. Anderson, M.D., 101 Willmar Avenue, Willmar, MN 56201.

HOW TO KEEP KIDS HAPPY — Playscape[®] centers. Rugged, compact, colorful, two-level children's activity structure for your waiting room. A marketing idea already proven by over 60,000 happy little Wisconsin patients. Educational, imagination-stretcher play stations. Irresistible crawl spaces. No loose toy clutter . . . just lots of fun. Your pediatric patients relax and come to your examining room in a cooperative frame of mind. Space savers. Staff pleasers. European "knock-down" connectors make assembly simple with no schedule interruptions. Call or write for a free color brochure today. PLAYSCAPES, Children's Environments 902 Spaight Street, Madison, WI 53703. (608) 251-0238.

MEDICAL DOCTOR to become Associate Chief of Medicine, Director of Ambulatory Care. Prefer Board Eligible/Board Certified Internist with background in primary care internal medicine. Position offers: a competitive salary, a 40 hour week, malpractice coverage, 30 days paid vacation, and other excellent fringe benefits, in a JCAH accredited progressive medical center having a large patient population, adequate staffing, including Physician Assistants, and research opportunities. Financial assistance to defer cost of relocation. Equal Opportunity Employer. Write or call Personnel Service, Veterans Administration Medical Center, St. Cloud, Minnesota 56301, (612) 252-1670.

FAMILY PHYSICIAN needed to join a Multispecialty Group in a growing area of Minnesota. The Group is young and progressive and provides a great opportunity to a Board-Certified Family Practitioner. A large hospital utilized for the hospitalization of patients with back up of specialists. The call schedule will allow you the opportunity to enjoy the cultural and recreational activities which are abundant in this area of Minnesota. Salary and fringe benefits are open and negotiable. If interested, please send your curriculum vitae to Minnesota Medicine (736), 2221 University Avenue SE, #400, Minneapolis 55414.

FAMILY PRACTITIONER — Join an active practice in Northern Minnesota. Two young F.P.'s are looking for one or two associates to replace retiring partner. Attractive clinic and 44 bed hospital in a friendly town of 2000. Contact W. Ofstedal, M.D., 218-435-1212, Fosston, Minnesota 56542.

(Continued on page 654)

Classified Advertisements

(Continued from page 653)

GENERAL SURGEON AND INTERNIST to join 8 family physicians and 2 internists. Recently remodeled and expanded clinic facility, 6 blocks from modern well-equipped 99 bed hospital, 45 minutes south of Minneapolis on 35W. First year salary guarantee, paid malpractice, life and disability insurance, vacation and study time.

Contact Darral Mischke, Clinic Administrator, Faribault Clinic Ltd. 924 N.E. 1st Street Faribault, MN. 55021.

FINANCIAL PLANNING by a Certified Financial Planner. Free brochure. Jack Kehrberg, CFP; 3030 Harbor Ln. N., Room 200F; Minneapolis, Mn. 55441. Phone (612) 559-7176.

PROMINENT MULTI-SPECIALTY Twin City HMO has position available for board certified/eligible Ophthalmologist with special interest in ECCE, ICLE and IOL to join its staff in January 1984. Competitive salary and benefit package. Contact or send C.V. to:

Carole Dornblaser, SHARE, 555 Simpson, St. Paul, MN 55104, (612-645-9135).

FAMILY PRACTICE OPPORTUNITY — 60 min. from Mpls/St. Paul. Three-physician group practice (two F.P. and one Peds) interviewing for a family practitioner to join busy practice. Offices in Arlington and Winthrop, Minnesota. Progressive communities, excellent hospital, challenging practice. For information please write or call John Vener, M.D., Arlington Clinic, Box 587, Arlington, Minnesota, 55307, (612) 964-2285 or Gary A. Van House, (612) 927-3534.

STAFF PSYCHIATRIST CMHC has an excellent opportunity for a staff psychiatrist. Must be board eligible. Programs include in-patient, out-patient, education and consultation, specialized services to children, the chronically mentally ill, and the chemically dependent delivered in conjunction with a seasoned team of multi-disciplinary mental health professionals including two part-time psychiatrists. Excellent four-season recreational area. Salary and fringe benefits negotiable. Contact: Donald E. Frees, ACSW, Area Program Director, P.O. Box 646, Bemidji, MN 56601. An Equal Opportunity Employer.

FAMILY PRACTITIONER position available with Mankato Clinic Ltd. Our 30 man multi-specialty group attracts specialty referrals from a southern Minnesota area of 200,000 population. Excellent group practice opportunity in All-American community with full hospital services; full range of group fringe benefits, liberal time off, salary first year; incentive pay thereafter. For more information call collect R.F. Roskens, Administrator or Dr. B.C. McGregory 507-625-1811.

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(Continued on page 656)

(Continued from page 655)

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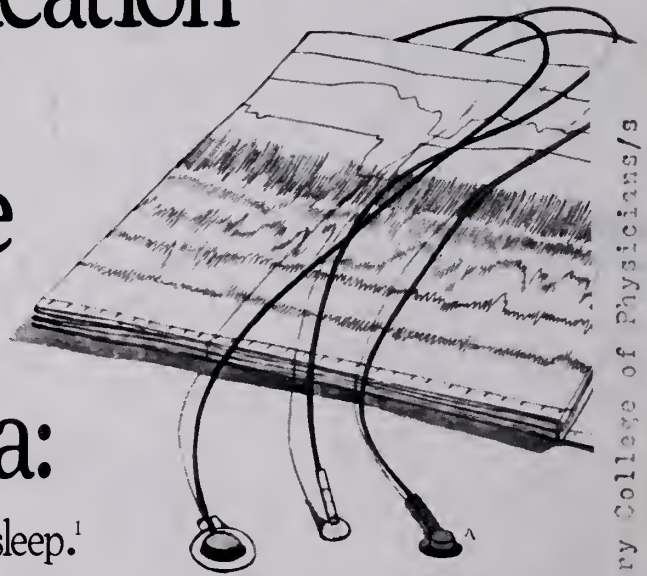
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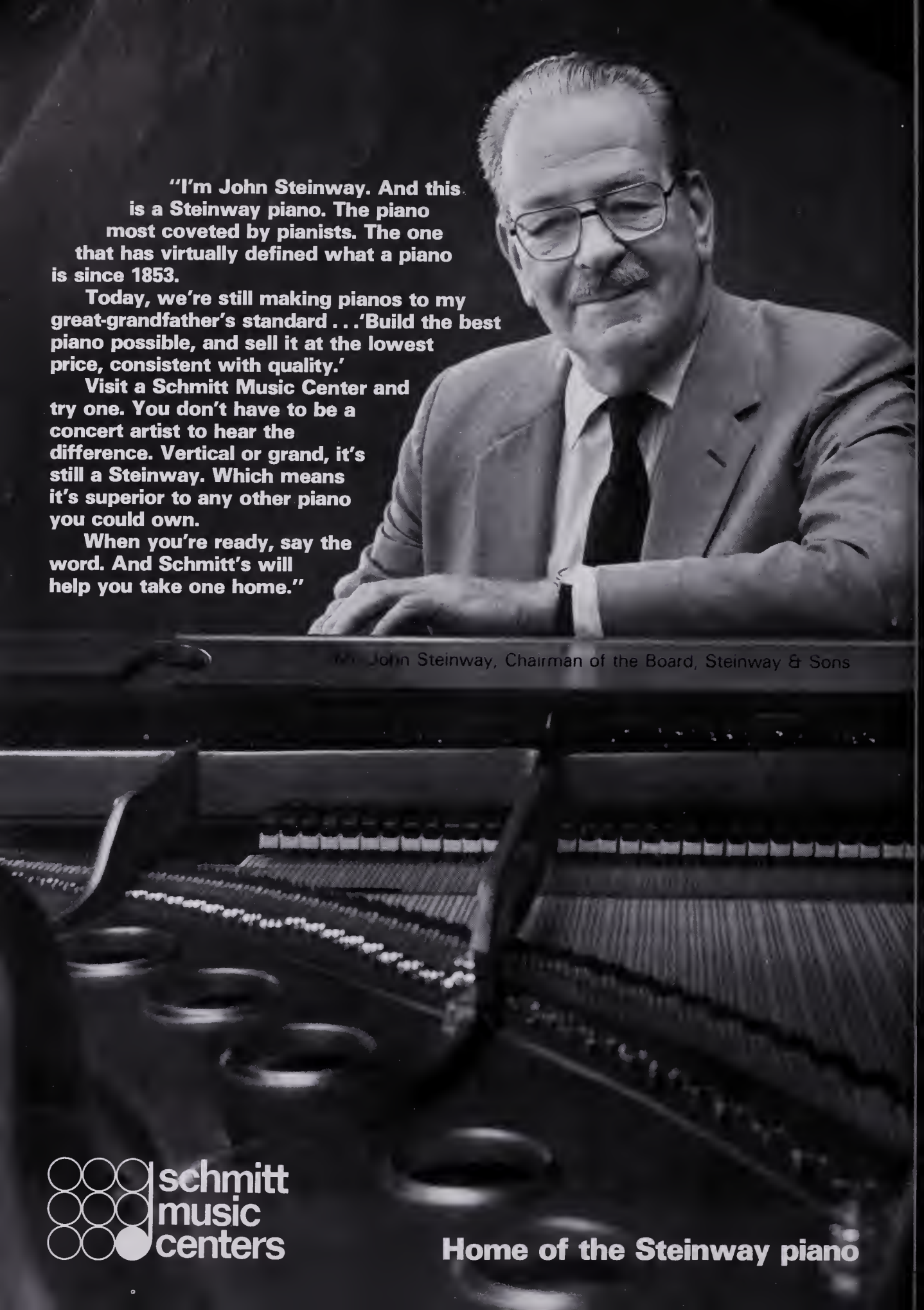
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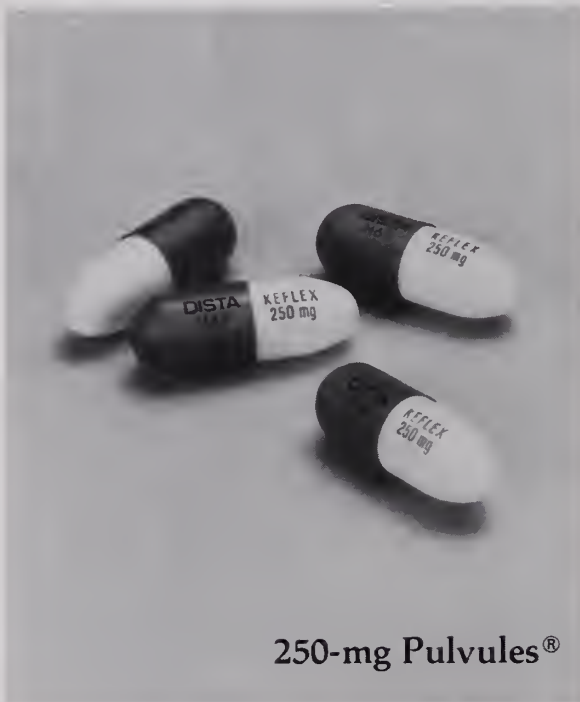
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Editor's Preface

This is a landmark issue. Since the founding of MINNESOTA MEDICINE in 1919, this Journal has devoted itself mostly to scientific material. But this month, for the first time, our contributors write only of money, management, and for the want of a better phrase "the changing health care environment."

What may surprise you is that I did not totally plan this issue. Papers simply started piling in from diverse sources. As the pile mounted, I knew we had a special issue in the making. Early on, I decided not to tamper with the authors' words, but to let them speak in their own voices. For these reasons, I think this issue has a special mix of diversity and spontaneity. The views expressed do not necessarily reflect the positions of the Minnesota Medical Association.

The voices you hear in this issue are telling you something — we physicians are undergoing a profound change in our attitudes toward the economic forces that have descended upon us. This change may best be reflected in my lead editorial. What I am saying is this: We should confront the economic realities, talk about them, and organize to adjust to them. But to adjust we must first understand.

If this issue helps you to better understand the present power struggle for control of health care, I will be pleased.

Richard L. Reece, M.D.
Editor-in-Chief



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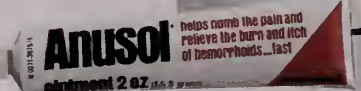
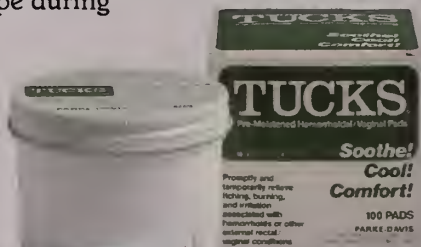
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President's Letter



Pintos, Profits and Patients

Let us reconstruct a scene which took place in 1970 somewhere in the Ford Motor Company, probably at a mid-management level. A group of people have gathered in a conference room. The lights have just been turned on after the viewing of some film showing tests of the new compact car that Ford planned to market under the name Pinto in 1972. The pictures showed that when the car was backed into a wall at 20 MPH, liquid sprayed in all directions from the gasoline tank (filled with water for these tests). A later observer of this film said that it "looked as if a fire engine was inside the car testing its hoses."

There must have been some sober faces in the group and perhaps a few throats being cleared. The company had designed this car to compete with European compacts that were invading the American market. To compete with the European's unibody construction technique, which resulted in a significant reduction of weight, this car was designed to have the gasoline tank in back of the rear axle, 3¼' in back of the housing for the differential gear. To save weight, a minimum of bracing was put in. Consequently, an impact from the rear would shove the gasoline tank forward into the differential gear housing which would "act like a can opener" to quote another later observer, causing rupture of the gasoline tank.

Now the decision making group had a major problem. The cost of putting adequate bracing to protect the tank would be about \$15.00 per car. The total cost (or reduction in profits) was estimated to be 21 million dollars, however, probably due to changes of equipment, production delays, etc. There probably was also figured into this decision the estimated number of rear end collisions and the estimated number of settlements with the resulting burn victims.

Lilly Grey and George Grimshaw could not have known it, of course, but when the decision was made at Ford to save the 21 million dollars, and market the car as designed, their fate was sealed. When their Pinto automobile was stopped on a fog enshrouded

California highway they were rear ended with an estimated impact of 20 MPH by another vehicle. The ensuing fire killed Lilly Grey, who was driving. George Grimshaw suffered burns over 90% of his body, losing his nose, left ear, and much of his left hand in the flames and requiring 64 operations.

In 1978, the jury which heard the case was so appalled by the apparent callousness of the decision to build this dangerous car that they extracted the \$100 million dollar profit that Ford made in sales of the Pinto and added an additional \$25 million dollars as punitive damages.

No more vivid example comes to mind to illustrate what happens when people govern their decisions by total adherence to the business ethic. This ethic is the profit motive. It holds that everything should be done to maximize profits without considering other factors. This means that management's *only* obligation is to the stockholders of the company.

To quote Mr. William M. Agee, chief executive officer of the Bendix Corporation, after his effort to achieve a hostile takeover of Martin-Marietta Corporation had nearly ruined both companies: "Anything I can do to increase the value of the stockholders is ethically right," or words to that effect. He went on to elaborate that humanistic concerns have no place in such decision making and that society is ultimately best served when profits are maximal.

The pertinence of this event to the health care scene is that health care is now regarded as a commodity by the business world as well as the political world. This means that health care must obey the laws of commerce and the laws and regulatory agencies of our nation (the Justice Department and the Federal Trade Commission). The same ethic that guided the automakers to market a car they knew with exact knowledge was unsafe will now govern how much medical service will be marketed and by implication what its quality will be. The same ethic as that which was followed by Mr. Agee will dictate that medical serv-

ices will *always* be secondary to the need to maximize corporate profits. Medical services are in the same category as wages and the corporate urge is to minimize both. It should be noted that the Ford Motor Company did not have its own survival at stake. What was at stake was maximal profits. No one disagrees that a corporation must make a profit to survive and to function well, but what is not defined is how much profit is sufficient and at what sacrifice in quality of product.

By contrast, we have always felt ourselves to be members of a profession and to be guided by the professional ethic. One definition of a profession might be "an occupation that services an ideal" — in this case, the ideal of caring for the sick, with full application of all modalities being made available to help each individual patient, even when we know there will be no payment. In other words, if necessary, the service will be rendered without the provider profiting.

We can perhaps appreciate the depth of the dichotomy between the two ethics by considering an analogy with some of our sister professions. Can one conceive of the pressure being placed on a Christian Minister to practice cost-effective salvation efforts on behalf of his parishioners? Can one imagine the Justice Department insisting that non-Christians be given equal access to the pulpit? Have we heard of caps being placed on legal fees or the amount spent on defending criminals at the bar of justice?

It would be wise for us to try to understand, as best we can, the implications of medical care becoming a commodity. A few thoughts about this that have occurred to me:

- The extreme pressure on us by the Department of Justice and FTC to eliminate all possible elements of anti-competitive behavior — including removing us from peer review, professional disciplinary functions, credentialing processes, and dominance of hospital medical staffs — follows logically. It is their job to regulate commerce. Being a commodity makes us the very stuff of commerce. They look upon these functions with a one dimensional view. These functions are conceivably anti-competitive, and, therefore, no social benefit is brought into their further consideration.
- There is a truism in commerce that once a certain degree of quality is achieved, competition is mainly that of pricing. Thus, the plethora of plans competing for blocs of patients with price competition working toward progressive limi-

tations of both physicians' charges and physician activity in behalf of the sick. Profit margins must be maintained and increased. Management that disregards safety in automobiles, which they thoroughly understand, will disregard even more easily quality consideration in health care which they do not understand.

- Business leaders tell us that there is a great deal of investor interest in commercialized medical care and that such investors envision huge profits to be achieved from nationwide commercial prepaid health plans. They envision their only competition as coming from preferred provider organizations and currently functioning HMOs. They say that fee-for-service medicine financed by indemnity insurance plans will offer no significant competition to their commercial plans.
- The profits which will govern decisions regarding the amount of health care to be marketed are the profits of the financiers of industry (or the budgeters of government), not the income of those who deliver the care. *The public who objected when doctors made money by delivering care (charging that it was too much care for too much money) may find that the profit motive now being oriented against their care to be even less satisfactory.*

One does not have to search hard to find examples of the business ethic of profits being placed above all human consideration governing decisions. For example, a Minneapolis Department Store a few years ago was purchased by some investors from New York. The new owners have cancelled their employees' pension plan and have refused to fund their employees' health care plans, thus wiping out the security of many people who have devoted many years to their jobs.

A food processing plant in a small Iowa town was doing good business producing high quality products, employing 1,400 people and forming the main basis for the town's economy. It was bought out by a large grain company. Within a week, over 500 people were fired, some of them during the middle of one of their work shifts. The quality control division was closed, and quality assessment allowed to drop back to minimum federal standards, well below that which the company had been maintaining.

I found myself riding in a taxi from the Chicago airport to the downtown area a few weeks ago. I shared the cab with two business men who were attending a marketing show. They each owned a company in Minnesota which manufactures automobile parts. They began to discuss their business, and one

PRESIDENT'S LETTER

was excitedly telling the other that his company had built an assembly plant in Mexico. "You can get those women to work for \$1.00 an hour," he said. "Also, we ship the assembled parts to Canada, and therefore, avoid paying U.S. taxes." After they were left off, the taxi driver turned to me, and said, "I am a new American. (He appeared to be of Latin-American extraction.) I may have more pride in my new country than some 'old' Americans. Why don't they assemble their products in this country, give jobs to their own countrymen, and support our country with their taxes?"

The answer to the taxi driver's question is that these men who are very fine, moral people (I was previously acquainted with one of them) were following the dictates of the business ethic and maximizing profits in any conceivable legal way.

I recognize that profit motive is the engine which has driven this country to its world economic leadership. The concern that I am expressing here, however, is that for the first time in our history it has been

decided that the amount and type of medical care delivered to our people (including these businessmen and their families) will be determined by this same motive which leads them to ignore the needs of the people in our country for jobs. It will be even easier to minimize the amount of health care and impair its quality than it was to build a plant in Mexico.

Profits and patient care don't always mix very well. In the coming era of continued and accelerating suppression and oppression of the medical profession, our adherence to our own professional ethics will be challenged as never before. It will be a priceless commodity (to borrow the term) for our patients.



Donald C. Bell, M.D.
President
Minnesota Medical Association

Physicians in the News

Chester A. Anderson, M.D., Hector, Minnesota, is the American Academy of Family Physicians' Family Doctor of the Year. A past president of MMA, Dr. Anderson has chaired the Legislative Committee of both MMA and MAFP. Currently, Dr. Anderson is the president of the Minnesota State Board of Medical Examiners.

AMA Hospital Medical Staff Section

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Editor's Notebook

The Corporate Transformation of Medicine in Minnesota: First of A Series: The Accelerating Industrialization of Health Care in the Twin Cities

"What is not fully appreciated by those who embrace competition is that it will mean a major restructuring of the health care industry and the demise of many existing institutions. Hundreds of hospitals will likely close their doors and as many as several thousands more may be acquired by large hospital management firms, as free-standing units become increasingly available to compete effectively in price and quality of care. Physicians who have enjoyed unprecedented economic freedom face the prospect of declining incomes and an escalating threat to fee-for-service practice from prepaid health plans and integrated health care providers."

Jeff Charles Goldsmith, *Can Hospitals Survive? The New Competitive Health Care Market*, Dow Jones-Irwin, Homewood, Illinois, 1981

"In the twentieth century, medicine has been the heroic exception that sustained the waning tradition of independent professionalism. Physicians not only escaped from corporate and bureaucratic control in their own practices; they channeled the development of hospitals, health insurance, and other medical institutions into forms that did not intrude upon their autonomy. But the exception now may be brought into line. . . The great irony is that the opposition of the doctors and the hospitals set in action entrepreneurial forces that may end up depriving both private doctors and local voluntary hospitals of their traditional autonomy."

Paul Starr, *The Social Transformation of American Medicine: The Rise of a Sovereign Profession and the Making of a Vast Industry*, Basic Books, Inc., New York, 1982

MINNEAPOLIS — In this series of editorials, I shall discuss the struggle now going on for control of health care. This struggle is mainly between the management of corporations and physicians. It is a struggle for power. To be effective in the marketplace, corporations have to harness physicians to corporate goals, thus creating internal discipline and compliance; to be independent professionals, physicians have to be free to choose what they want for their patients. The government, economists, and leaders of large organizations favor the corporate strategy because it is a way of making physicians behave economically. Health care corporations often deny they seek power, saying that this power flows from impersonal forces of the market. This may be, but the forces of the market are powerful indeed and are fundamentally changing the way we practice medicine.

This First Editorial

In this first editorial, I shall illustrate the growth of the health care corporations in the Twin Cities, discuss this growth in light of interviews I have conducted with 25 Twin Cities health care leaders, reveal the reasons behind this rapid growth, comment on why management is winning the battle for control of health care, touch on the mood of despair

among fee-for-service physicians, and conclude with comments on what physicians are doing to accommodate to competition between each other and against corporations.

The Rest of the U.S. and Us

Compared to other parts of the United States, even to the rest of Minnesota, health care is becoming more rapidly industrialized in the Twin Cities. Don't misread me. This process is picking up steam elsewhere. But because of a combination of factors in the Twin Cities — a historic tradition of large group practices, existing HMOs with 30 percent penetration of the current Twin Cities patient market, a physician surplus greater than most major cities, one-third of its forty hospitals with censuses of less than 55 percent, active backing of prepaid plans by 25 Twin Cities based billion dollar multinational corporations, an unusually high concentration of innovative and catalytic health care thinkers and leaders, a close-knit peer network of alumni from Minnesota's medical and hospital administrative schools, 72 percent of Twin Cities hospitals (versus 35 percent of U.S. hospitals) already belonging to health care systems or alliances, and a progressive citizenry who do not hesitate to engage in broad social experiments — industrialization and systems building in the Twin Cities are escalating on an unprecedented scale and with great speed.

Growth of Corporate Medicine in the Twin Cities

If you doubt what I've said so far, I invite you to consider the growth of corporate medicine in the Twin Cities in the last year or so.

- Twin Cities HMOs have now penetrated 30 percent of the market and are aiming for 50 percent penetration (the more brash HMO executives, encouraged by results of recent media campaigns, are saying 60 percent capture of market share is within their grasp).

- At least six Twin Cities Preferred Provider Organizations (PPOs) have formed but none of them have yet effectively marketed their product to industry. (The word on the street about the PPOs' progress is contradictory, namely, PPOs are five years too late; panicky fee-for-service physicians are leaping on every PPO bandwagon; or PPOs will ignite like a prairie fire once insurance companies fund them).

- The Hospital Corporation of America has taken over the management contract of Mt. Sinai Hospital in Minneapolis, has cut the number of employees by 15 percent across the board, and is recruiting physicians for their new office building (Voluntary hospital leaders are watching these developments with skepticism but are anxious to see how for-profit-hospital methods work in the Twin Cities competitive environment).

- Health Central has closed Golden Valley Health Center as a medical surgical unit and has sold 50 percent of the medical center for \$9 million to Comprehensive Care Corporation, a California company that deals in alcohol and drug rehabilitation. (This is just part of Health Central's larger strategy, which is outlined in their publication "Environmental Assessment, Health Care, New Dynamics, New Markets.")

- St. John's Hospital in St. Paul, through its holding company, Health Resources, Inc., now owns an ambulance company, a nursing home, a professional building, a combined urgicenter and surgicenter, and is involved in a senior housing project.

- United Hospitals in St. Paul and Metropolitan Medical Center in Minneapolis have consolidated operations to form a health care corporation with more than 1000 beds, \$147 million in revenues, \$175 million in assets, with another PPO, Metro Medical Associates, Inc., (Whether this unique combination of St. Paul and Minneapolis Hospitals will increase the PPO's marketing strength remains undetermined).

- General Mills of Minneapolis and the Wilder Foundation of St. Paul have announced a \$5.3 million not-for-profit ALT CARE corporation to develop and finance an alternative health care delivery system for senior citizens, and Health Central has joined with ALT CARE and St. Paul Ramsey Hospital to start a prepaid plan called Senior Health Plan (The latter is said to be a "social HMO", an organization that deals with health care, as

EDITOR'S NOTEBOOK

well as financial, housing, and legal problems of the elderly).

- Fairview Community Hospitals, a multihospital chain, has opened a one-day surgical center, plans to market seven to nine urgicenters in suburban shopping centers, closes Lutheran Deaconess as a medical surgical hospital, and ploughs ahead with construction of its new Burnsville Hospital.

- Abbott-Northwestern Hospital forms LifeSpan Corporation, builds a 145 bed hotel unit adjacent to its hospital, makes the old Abbott Hospital into a 185 bed specialized care facility, lays plans to open an unspecified number of urgicenters in conjunction with a Chicago entrepreneur, and entertains ideas of entering into multiple joint ventures with its medical staff.

- The St. Louis Park Clinic, the Twin Cities largest multispecialty clinic and its second largest HMO after Group Health, merges with the Nicollet Clinic, and as Park-Nicollet Clinic becomes an organization that employs 260 physicians — probably the largest concentration of urban nonuniversity physicians under one corporate roof in America, and with over 150,000 HMO enrollees, its private practice side, 32 different locations, and a statewide private referral network, becomes the dominant force in the outpatient health care market.

- Group Health and SHARE, with 200,000 and 71,000 members respectively, continue to expand, and as a new wrinkle, purposefully seek accommodations with private primary and specialty medical groups to care for HMO patients (In a highly competitive market, distinctions between “closed-panel” and other HMOs tend to disappear, as physician groups begin to adopt HMO tactics).

- Rumors are afoot that at least two Twin Cities HMOs will begin or have begun marketing in adjacent states such as Iowa and Illinois with low HMO enrollments, and that one or more Twin Cities HMOs may go public to finance further growth.

- The Hennepin County Medical Center forms an academic practice plan, Hennepin Faculty Associates, that is essentially a group practice that will take care of the medical needs of Hennepin County Medical Center and will bill separately for physician services.

- All major Twin Cities hospitals expand their marketing staffs, either form or look into forming holding companies for-profit enterprises, open outside laboratories, and, in general, function as broadly based health care corporations with an eye on outside markets.

- A major corporation, Control Data, becomes an integrated health care provider. Control Data already offers these services — Executive Health Examinations, Laboratory Testing, “Wellness” Services (including medical evaluation, health education, and anti-smoking programs), Utilization Review Systems for self-insured employees, and Computer Systems for medical office management.

- Blue Cross and Blue Shield, Minnesota's largest health-related corporation, but one with eroding markets, announces their statewide AWARE program. The hospital part of the program began seven months ago, when 20 of 27 Twin Cities Hospitals became preferred hospitals by agreeing to accept preset per-day reimbursements. Eighty-nine percent of Minnesota physicians agree to become members even though the program requires them to accept preadmission authorization, to refer only to participating physicians and hospitals, and to accept utilization controls. Physicians who join are reimbursed at 85th percentile, and those who don't, are reimbursed at the 55 percentile. Eighty fifth and 55th percentile does not mean 85 and 55 percent of customary fees. Indeed, at the 85th percentile, and even at 55th percent, most doctors will receive their full fees. (The Minnesota Medical Association supports the plan as a way to support the fee-for-service segment in the marketplace, and Blue Cross/Blue Shield, with 800,000 members, begins to act like an HMO to protect its markets).

- The Hennepin County Medical Society forms a medical staff-hospital joint venture steering committee to develop an organizational model, complete with model legal contracts, which will provide the basis for hospitals, and then medical staffs, to develop

their own programs whereby they can share equally in the responsibilities, risks, and benefits of dealing with such initiatives as: DRGs, surgi-centers, and PPOs. To date 12 hospitals have joined with the Hennepin County Medical Society in this venture. Once again, Minnesota physicians are taking the lead and taking steps to accommodate to the new realities.

- Following on the heels of its 1980-83 prepaid Medicare "experiment" which shunted thousands of Minnesota citizens to HMOs, the Federal Government announces in July, 1984, it will select four Minnesota counties — Hennepin or Ramsey, Washington or Anoka, Crow Wing and/or Itasca — for prepaid Medicaid projects. (This second Federal "experiment" will effectively remove another large market segment from individual practitioners. The government message for the future is quite clear: either you join a corporate entity or write off the Medicare/Medicaid population as a source of patients.)

National Backdrop

Three years ago, I argued health care industrialization is a phenomenon likely to remain concentrated in the Twin Cities.¹ I was wrong. I underestimated the cumulative impact of continuing health care inflation, impending exhaustion of Medicare funds with resulting DRG and TEFRA legislation, persisting demands of business and consumers for less costly alternatives to traditional health care, mounting powers of the forces of the de-regulated market, and emerging importance of surplus physicians in entrepreneurial activities.

We are now in a tough new period — the era of industrialized medicine with managed health care corporations, multihospital systems, free-standing for-profit independent units, and physician entrepreneurs. The "Medical-Industrial Complex", described and deplored by Arnold Relman, Editor of the *New England Journal of Medicine*, has emerged as a powerful local, regional and national force.² As many as 20 urgicenters and six surgicenters will soon be operating in the Twin Cities, Twin Cities HMOs will boil over into neighboring states, and national HMO chains — Prudential, Cigna (a merger of INA and Connecticut General Insurance), Kaiser Health Plan, American Medical International, and Charter Medical Corporation — in 1982 had their "best year ever."³ Other HMO chains are going public at 60 to 80 times earnings with considerable success. California HMOs lead the nation with 20 percent market penetration with Minnesota close behind at 16 percent (largely due to the Twin Cities 30 percent penetration).

National hospital companies are growing fast too. Here is a list of leading companies with number of hospitals owned, leased, or managed and their revenues in billions of dollars: Hospital Corporation of America 351 (\$3.5), Humana 91 (\$1.5), National Medical Enterprises 356 (\$1.4), American Medical International 80 (\$1.4), and Lifemark 31 (\$0.5).⁴ These national hospital companies now run about 20 percent of the nation's 7000 hospitals.

The Harvard Confrontation

No institution is out of the financial grasp of these booming hospital corporations with their access to capital. Even Harvard and its teaching hospitals are vulnerable. The faculty of the Harvard Medical School and the trustees of Massachusetts General Hospital are now debating whether to approve the sale of Harvard's major psychiatric teaching hospital, McLean, to the Hospital Corporation of America. Arnold Relman, the *New England Journal* editor, sees the sale as a "dramatic confrontation between the bastion of academic medicine, with the most distinguished teaching hospital in the country with the biggest, richest hospital company in the world. If Harvard approves the sale, it's going to a very important bell-wether of where our society is going to go."⁵

With hospital chains growing at 20-25 percent a year and academic centers in decline, most analysts feel the economic bells are tolling for hospital chains rather than for non-profit academic centers. In response to Relman's remarks, Charles Martin, vice

President of Hospital Corporation of America, said: "We just don't think the relationship between academic medicine and business is one of mutual exclusivity." Translated, I assume by Martin's remarks he means academic medicine needs capital and management too.

Reasons Behind Corporation Activities

What are these various national and regional corporate activities about? Why are these corporations doing what they are doing? Or, as one exasperated physician blurted out, "What the hell is going on?" Why are organizations competing vigorously for market share. Why all this posturing, priming, and pitching for clients? To many physicians, these activities are degrading and unprofessional.

What is going on is called *Corporate Growth*. This growth requires market penetration, capture of market share, changes in corporate structures of non-profit hospitals, and consolidations to achieve higher levels of integrated control for greater effectiveness, economies of scale, and more efficient services.

According to Paul Starr, author of *the Social Transformation of American Medicine*, five dimensions of corporate growth exist.⁶ These are:

1. *change in type of ownership and control* (the shift from non-profit and governmental organizations to for-profit companies in health care);
2. *horizontal integration* (the decline of freestanding institutions and rise of multi-institutional systems, and the consequent shift in the locus of control from community boards to regional and national health care corporations);
3. *diversification and corporate restructuring* (the shift from single unit organizations operating in one market to polycorporate and conglomerate entities, often organized under holding companies, sometimes with non-profit and for-profit subsidiaries involved in a variety of health care markets);
4. *vertical integration* (shift from single-layer-of-care organizations, such as acute level hospitals, to organizations that embrace the various phases and levels of care, such as HMOs);
5. *industry concentration* (the increasing concentration of ownership and control of health care services in regional markets and the nation as a whole).

So there you have the dimensions of what health care managers are doing and where the health care industry is going.

But the propelling reason behind this pervasive push for corporate growth is the smell of big profits. After all, health care is a vast and often fragmented \$360 billion industry, arguably the third biggest business in America behind education and automobiles. Corporations perceive health care as a business with a lot of waste and fat in it because of the inefficiencies of the fee-for-service system. Because of this perception, corporations are moving to reorganize fee-for-service medicine. When I asked an HMO president how fee-for-service physicians might respond to his organization's activities, he said: "We don't care. We don't even regard private physicians as legitimate competitors. We can always beat their price by 20 percent, so we ignore them."

Interviews

Over the last three months, I have interviewed 25 Twin Cities health care leaders. These 25 have included practicing physicians, medical politicians, medical society executives, hospital administrators, multihospital chain executives, HMO presidents, HMO medical directors, health care finance people, medical think-tank participants, patients of private physicians and HMOs, and managers of professional associations. To each leader, I have said their interviews were not for attribution. And to each, I have put two basic questions: 1. What do you think is now going on in the Twin Cities health care scene? 2. What do you think the Twin Cities health care landscape will look like in five years? I made the questions broad because I doubted if these leaders would divulge their specific

organizational strategies. Rather than cite the substance of any of these interviews, I would like to take the editorial license of synthesizing, summarizing, and compressioning their remarks into this brief passage:

Currently, the Twin Cities health care market is turbulent. We are experiencing a restructuring, realignment, and shakeout of existing organizations, and many physicians are having a tough time finding desirable positions, maintaining their practices, or financing new practices. The two underlying struggles are the battle for market share and control of the system. Large organizations — HMOs and bigger hospitals — are positioned best to win these wars (as one HMO medical director said to me: "If you don't think this is war, you are kidding yourself.")

These competitive struggles and uncertain trends are creating tensions — between institutions, between institutions and doctors, and between doctors themselves. Organized Medicine is having a hard time adjusting because it now represents physicians in all sectors — fee-for-service, private HMOs, multispecialty clinics, and the academic world. It is hard to unite these physicians when they are competing for each other's business.

One hospital president commented: "It's a time of Megatrends and Megatensions." An HMO executive said, "The current state of constant agitation and freefloating anxiety has created a kind of massive Brownian Movement in the market."

In view of most (but not all) of these observers, the five year forecast is that only four HMOs will remain with roughly 50 percent of market penetration, and four, maybe five, multi-hospital systems will dominate.

As for practicing physicians, about one-third will remain in fee-for-service practice outside the giant groups or HMOs. But practice will not be like the old days. These fee-for-service physicians will either be part of networks, such as the present Physicians Health Plan, or the Blue Cross/Blue Shield AWARE plan, or will have made accommodations to work on a contract basis for HMOs, industries, hospitals, or other providers. These things, of course, are already happening. The consensus of those I interviewed, both inside and outside organizations, was that large organizations and their managers are winning the battle for control of health care.

Other Lessons from Interviews

From these interviews, I learned another thing or two: (1) no one knows with certainty where we're headed (A Mondale election in 1984, for example, could dramatically slow the momentum towards corporate medicine); (2) everybody thinks we're in a watershed period with irreversible changes taking place; (3) managers are supremely confident, even arrogant, about the future belonging to large organizations; (4) independent physicians, for the moment at least, fear for their future and feel outflanked, out organized, and out financed; (5) a tremendous amount of anxiety exists among both hospital administrators and independent physicians.

I came away from these interviews with the impression that the Twin Cities abound with tough-minded, thoughtful, and experienced health care people who are willing to make structural changes in the current system and to take risks to make those changes stick. These changes are going to hurt many physicians and many organizations. In a regulatory system, which favors the status quo, everybody gains or loses a little. In a competitive system, you have big winners and big losers. Given a competitive system, a physician surplus, a declining supply of patients, and an Administration dedicated to quelling health cost inflation, physicians are no longer guaranteed financial success, professional satisfaction, or employment in desirable practice locations of their choice.

Physicians' Present Mood

Before the present competitive mood evolved, most physicians would have agreed with these general propositions: (1) Medicine is not a business because it deals with people and

not products; and (2) physicians are not businessmen, but independent professionals. Moreover, it was considered poor form to even talk about the business decisions of practice. Why talk about them? After all, given reasonable professional competence, financial rewards would follow. The only things that really counted for success, the truism went, were ability, affability, and availability — not necessarily in that order.

These propositions no longer are worth a damn. Most of us are now professionals who depend on business men, and we are a central part of a multibillion dollar industry from which we receive perhaps 15 percent of the income and make 70 percent of the decisions. Being a physician-businessman is no longer a moral stigma; it is becoming an indispensable asset.

Yet, despite our earning and spending power and collective clout, physicians are confused about the present and despair for our future. We regard ourselves as passive victims of huge forces — big government, big business, and big third parties. We see large blocs of potential patients snatched from our grasp before we can show them our skills or bedside manner; we see impersonal brokers who know little about patient care decide our destiny; we see corporations flooding the printed pages, radio airways, and televisions with seductive and often deceptive messages about low-cost, comprehensive, and quality care; and we wonder how we can compete for patients or even defend them against the blandishments of businessmen. As individuals, we are depressed, disillusioned, and even disgusted.

Physicians and the Future

In a poll by Louis Harris and Associates, 48 percent of 1814 physicians said they would not recommend a career in Medicine to others for six reasons; (1) loss of autonomy (due to government regulations and third party controls); (2) loss of personal satisfaction (secondary to the eroding doctor-patient relationship, malpractice suits, and decline of public image); (3) excessive professional demands (paperwork and long hours); (4) inadequate financial rewards (doctors' earning power has declined since 1975); (5) insufficient practice opportunities (because of the doctor glut); and (6) demanding educational requirements (ever increasing continuing education requirements and need to keep up with new technology).⁷ In addition to polls like this, you hear doctors saying: "It was more fun in the old days. We were gentlemen and worked in a relaxed atmosphere. We were engaged in a profession that was different from other vocations. What we're doing now is simply a business."

Why Management is Winning

Why are those trained in management and their organizations winning the battle for the control of health care? Or, to put it slightly differently, why does management's power grow, and why are large organizations necessary to compete in today's health care market?

Victor Fuchs, a Stanford University economist who specializes in health care issues, gives three reasons: (1) large organizations have access to capital which finances growth; (2) large organizations have more effective mechanisms for dealing with bureaucratic phenomena, and (3) large organizations possess the true skills of management — organizing complex technology, maximizing the talents of specialists, and bringing together different people from different professions to deliver service as a team.⁸ Fuchs believes we must accommodate ourselves to the reality that physicians will never dominate Medicine in the future as we have in the past.

Here is Fuch's thinking about a successful health care organization: "A good example of successful accommodation — where physicians have remained in charge of what is important to them — is the Mayo Clinic in Rochester, Minnesota. A visitor to Mayo cannot help but be impressed by the degree to which the organization has worked out the necessary compromises between practicing physicians and management. To an outsider,

the organization seems to work smoothly. Significant power and authority is vested in management, but it is shared with the practicing physicians . . . Mayo is a \$250-million-a-year operation, and it runs smoothly, efficiently, and profitably. It is not possible for a \$250-million-a-year operation to run smoothly, efficiently, and profitably by practicing physicians. But, if the physicians perceive that they still have the power, that is great."⁸

But other than capital, ability to cope with bureaucracies, and management skills, managers have another advantage — they are trained to *think differently*. As physicians, we are educated to concentrate on the *individual transaction* — the one-on-one encounter with a specific problem or a specific patient. For the most part, we do not stop to think how the impact of each transaction ripples through a system. The professional manager, on the other hand, is taught to think in terms of events as a *process with a series of transactions*. Each transaction has a cost and a profit — and each is to be minimized or maximized by a *systematic, organized, and purposeful team approach*.

Because of these differences in education, tension inevitably exists between physicians, who wish to maximize what they can do for the individual patient no matter what the cost, and the professional health care manager, who desires to moderate costs by routinizing the transaction or reducing the number of transactions, or minimizing deviations from routine transactions.

And lastly, health care managers think of health care as a market. They see the market this way: (1) patients are confronted with making choices between doctors, health plans, and institutions; (2) in making these choices, patients do the best they can — given constraints of money, time, energy, and information; (3) relative “prices” effect patient choices and these prices are measured in time, psychic cost, and alternative costs; and (4) patient choices may be influenced by a host of other factors — religious affiliation of a hospital, loyalty to a private physician, need for personal attention, pressures of the employer, and tradition; and (5) a well-crafted marketing strategy can tilt any of these factors in favor of the corporation. What managers have been able to do is to portray health care *as a commodity*, to emphasize the importance of price, and to persuade consumers that in organization medicine other factors in health care — choice, accessibility, quality, and personal attention — are equal or superior to private medicine. HMOs’ market their plans through well-orchestrated advertising campaigns, offer comprehensive care at a fixed price and promise no surprises — no paperwork, no deductibles, and no extra-bills. This approach works exceedingly well, so much so that for some major employers, such as General Mills, the market penetration rate is nearly 80 percent.

What To Do?

Now for the hard part. What can we physicians do about this changing economic environment? How can we be more effective in influencing trends? Tough questions, and I have yet to interview anybody who articulates a scheme of action that satisfies everybody. The public wants the most care at the least cost; hospitals want to survive; physicians want to remain as independent professionals; and corporations want to manage the vast enterprise in a systematic, organized, and profitable fashion.

For starters (this, after all, is the first editorial in a series), perhaps we can consider these suggestions.

- First, let’s act within the context of existing organizations, but let’s be innovative enough to change. For examples: (1) I believe the Blue Cross-Blue Shield AWARE plan is an important step towards slowing the HMO momentum; (2) I can see where the Hennepin County Medical Society — Physician — Hospital joint venture model can minimize the potential DRG chaos; (3) I applaud the Minnesota Medical Association for developing marketing programs for practicing physicians.

- Second, let’s concede that this is an age of management in which major social tasks — from education, to economic services, to health care — are entrusted to large organ-

izations. Let's not say: "Down with health care organizational organizations!" Let's study management techniques and methods and let's apply them to our own situation in a responsible way that increases our leverage, maximizes our effectiveness, and brings the medical knowledge to society in the most efficient ways.

- As professionals, let's retain our autonomy by serving as quality watchdogs for health care organizations, making them perform responsibly with a high level of achievement and with the greatest humanity possible. The biggest danger, or blindside of corporations, is that they are treating health care *as a commodity*. Health care is more than that. In a similar fashion, the trouble with DRGs is that they treat patients *as a product* to be controlled, priced, limited, and parcelled out. People do not like to be thought of as a product, or piece of meat, moving through as assembly line. It is up to us to define the boundaries of quality in evaluating and treating humanity.

- Third, let's think of our strengths as a profession rather than our weaknesses. Let's recognize and announce that as a collective group, we monitor ourselves more closely than any other profession. Let's recognize in the last 10 years we have achieved tremendous advances through medical technology and public education — in lengthening life span by three to five years, in bypassing coronaries, replacing joints, in reducing mortality from myocardial infarcts and strokes by one-third, in using CAT scanners to help diagnose and treat head injuries, in salvaging premature infants, in developing new drugs to treat ulcers (cimetidine) and heart disease (propanolol), and, in general, bettering the human condition faster and on a greater scale than any previous generation of physicians.

- Let's acknowledge, that, as long as we maintain quality, stick together, and keep increasing our effectiveness, respect and economic rewards will follow. Let's build unity out of our diversity. What unites us is not how or what we're paid, it is our joint goal to keep up our standards in education, research, and human care.

- Let's maintain the leadership role of physicians in forming new health care corporations. Physicians in the Twin Cities have always been out in front of society in building multispecialty clinics, HMOs, Independent Practice Associations, and now PPOs. If we're out in front, we can make rules we consider desirable for the public and physicians. Otherwise we will have the rules imposed on us.

- Finally, let's not give up the fight for fee-for-service practice because of the corporate transformation of medicine. There is a tendency to equate this transformation with the rise of HMOs. This is a mistake. HMOs are just one manifestation of corporate medicine. Furthermore, they are not necessarily the wave of the future. HMOs, too, are vulnerable. Because the government has subsidized HMOs, promoted open enrollment, and forced employers to give employees a choice of HMOs, HMOs may seem more formidable now than they will prove to be in the long run. Employers are already finding that HMOs — because of their comprehensive first dollar coverage and driving up of other policies through adverse selection — do not necessarily save money. And insurers and fee-for-service schemes — through higher deductibles, through tighter preadmission and utilization controls, and through marketing opportunities presented by cafeteria benefit plans — are rapidly adjusting to the changing environment. What seems to be happening is that fee-for-service organizations and HMOs are accommodating to each other and reaching a state of equilibrium.

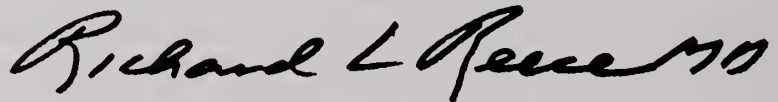
Concluding Remarks

I have tried to show how and why corporations are taking over the independent practice of medicine. These health care corporations may be run by HMOs, hospitals, businessmen, or physicians. Whoever manages or owns these organizations, corporations have these advantages over independent physicians: (1) access to capital, (2) mechanisms for dealing with administrative and bureaucratic tasks, and (3) the ability to organize complex technology and to bring together professionals from various fields to deliver service as a team.

EDITOR'S NOTEBOOK

To survive and thrive over the long haul, physicians may have to fight fire with fire and form *doctor corporations*. These corporations will be limited partnerships in which independent practitioners, as a group, will supply fee-for-service or prepaid care and will have a central management team that will handle billing and employment of personnel, negotiate legal and financial contracts with hospitals, nursing homes, industry, and corporations, respond to requests from other organizations for service, and provide for benefits (health, self, home, and automobile) for each limited partner.

What I see emerging in the Twin Cities in the next five years are seven or eight *health care corporations* (because of their restrictive connotations, the present corporation designations of HMOs, IPAs, PPOs, and hospital or physicians' plans, may no longer be vogue). All of these *health care corporations* now exist either in mature or developmental stages. *Health care corporations* will offer comprehensive plans — either prepaid, fee for service or both. Physicians will have considerable power in these plans, for physicians will still control access to the remaining hospitals, which will be linked to the plans because their survival will depend on the plans.

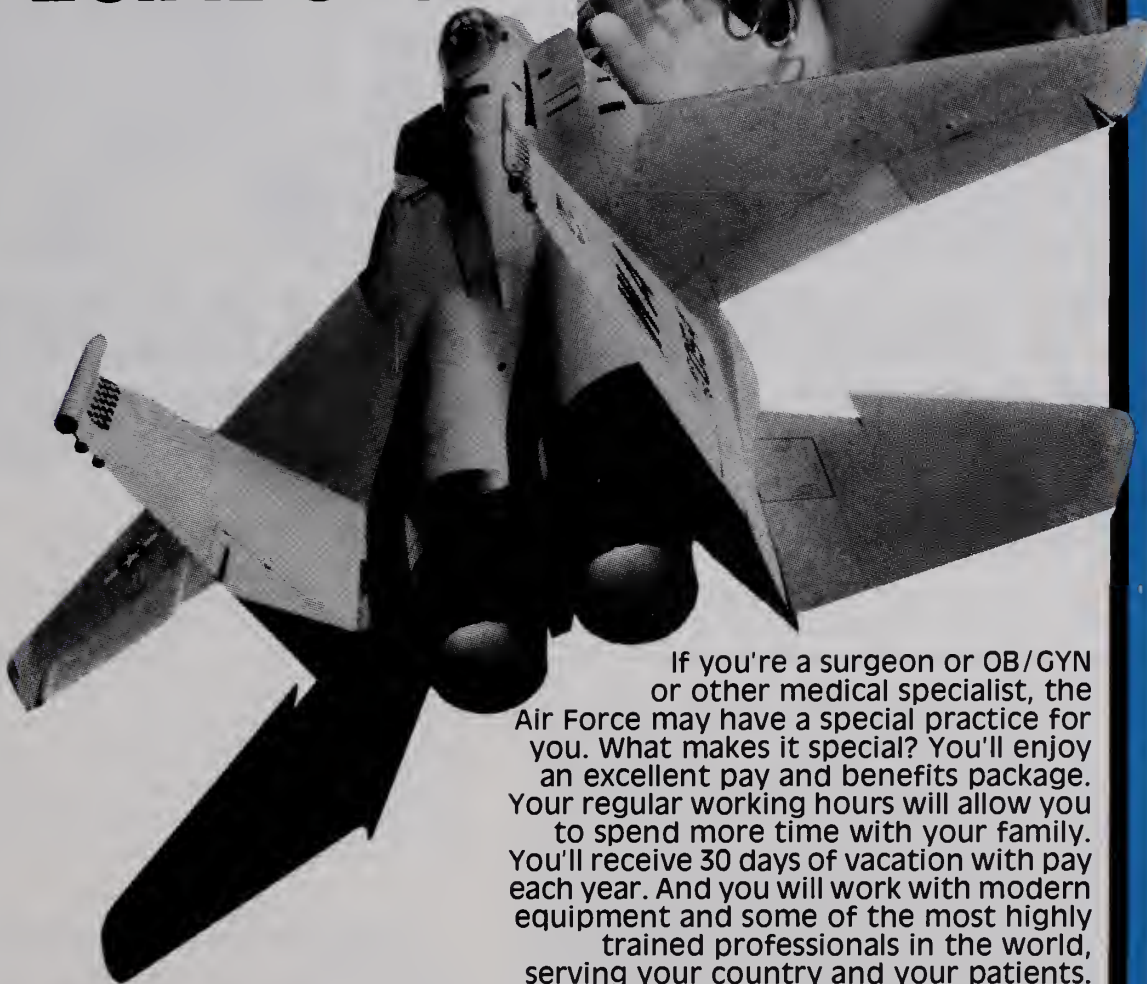


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Hospitalization Utilization Levels

The Application of Queuing

Theory to a Controversial Medical Economic Problem

DONALD G. McQUARRIE, M.D., Ph.D.*

HEALTH PLANNING vows to keep medical care less expensive. Unfortunate significant decisions have been made from untested assumptions and oversimplified data. A search for uniformity and equity has produced guidelines which do not recognize heterogeneity and functional differences between specific hospitals^{1,2}.

The sharpest controversies have arisen when the local planners exert strong pressures to reduce the number of hospital beds³⁻⁵. When bed closure is recommended strong coercion is implied. Failure to comply with plan recommendations could affect the approval of future capital projects from a hospital. Hence, the out-of-favor hospital would fall behind and wither.

The major thrust of "health planners" follows the logic that: (1) Because hospital beds are not 100% occupied there are too many hospital beds in some areas. (2) Maintaining these hospital beds in an unoccupied state adds to the cost of hospitalization. (3) Therefore, closing hospital beds will reduce health care costs by forcing hospital consolidation or by producing a shift in patient loads. This paper will focus on the major premise — the definition of excess hospital beds. Steps 2 and 3 may also be seriously questioned. An audit study by Ernst and Whinney of 18 institutions in Orange County, California showed that maintenance of excess beds accounts for only 2% of total costs, an amount "far lower than previous economic estimates, which have ranged from 16% to 20%."⁵

What Should Hospital Occupancy Rate Be?

In most geographic areas the H.S.A. planners have

developed a data base for regional hospitals which reports monthly and annual average daily census (A.D.C.).[†] They erroneously equate A.D.C./Number operating beds to utilization rate. Average daily census (A.D.C.) will understate true utilization.

From reading some newspaper articles and reported deliberations of long range hospital planning³⁻⁵, it appears that there is an unquestioned acceptance of the concept that hospital bed average occupancy can always be very close to 85% to 100%. A.D.C. levels below 80%-85%^{3,4} are taken to indicate that there are excess beds. Typically, an HSA group studies an area where hospitals have some 10,000 beds with an overall 75-80% A.D.C. They declare that there is a regional "overavailability" of 1000 to 2000 beds which are adding excessive costs to local health care. The exact number depends on whether they assume an A.D.C. of 80%⁴ or 85%⁵ as the minimum acceptable level. The local scribes rush to headlines, proclaim a crisis, and call for summary closure of 1000 beds. Pity the poor hospital with a 65% to 75% occupancy rate. These hospitals are summarily branded as inefficient profligate spendthrifts. The sins of medical cost containment are heaped upon them. The health planners are all too eager to cast the first stone of condemnation and closure at the overbedded scapegoat.

The basic notion that very high rates of continuous utilization of hospital beds can be achieved is sheer nonsense when viewed from the standpoint of industrial planning. The segment of mathematics and industrial engineering called *operations research* deals with providing maximum service in the most economical manner. In other enterprises, the industrial engineers have long realized that where order rate, supply rate, and other parameters may vary, there can never be 100% use of all production resources at all times. They know that a utilization rate of 100% would require an infinitely long waiting line of product, customers or clients. Eighty to 90% utilization requires unusually well controlled steady-state conditions and a uniform product. The term "plant capacity," when used in an industrial sense, has already

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[†]The first calculations one typically encounters in a medical region planning document is Average Daily Census. For this, the annual number of patient days is divided by 366. This base number should be seriously questioned! The functional service of a hospital is really only in full production for 261 to 313 days a year depending on the level of Saturday, Sunday and Holiday Services. On weekends, elective processes are inactive. Patients, physicians, and hospital staffs assiduously avoid weekend stays. Average Daily Census should be adjusted to reflect a smaller divisor. Both the number of functional service channels and the rate of service within those channels have wide fluctuation over an average week. The effects of an unsteady load are discussed later in this paper. We must also consider the case of unsteady production rate.

been corrected for random gaps, pauses and inefficiencies. A machine shop which is said to be at 100% of capacity making a single product with a fixed production cycle may have the lathes turning less than 80% of the time.*

A subsection of operations analysis called Queuing theory is directly applicable to finding a range for maximal hospital occupancy rates. The discussion of this paper is a primer. The citations of the bibliography are a better source for those interested in more detail about the subject.

How do Waiting Queues develop Relative to Utilization Rates?

A waiting line, or queue, results when the service rate of a facility falls short of the flow rate of its clients or calls. All of us have experienced waiting lines at ticket counters and the restaurants. If airports were to seek 90% to 100% utilization, the surrounding countryside would be littered with the wreckage of aircraft which ran out of fuel waiting in a queue for landing clearance. A queue can sometimes be eliminated by increasing the service rate of the facility or by duplicating the facility when a more judicious deployment of resources cannot meet the demand. At first look it seems trivial to match exactly the client service rate to the average rate of client arrival. Despite planners' wishes, customers arrive at irregular random times (Figure 1). If the idle times are irretrievably lost, there will be inefficiencies. At times a service channel will sit idle. At other times, several clients will arrive close together and create waiting lines. "The actual number served during any sufficiently long period can never equal the number of arrivals if the average gap between successive arrivals equals the service rate. As a result, queues must arise and grow indefinitely with passage of time^{6,7}". As soon as service rate begins to approach the mean arrival rate, waiting time is common and queue length increases. Figure 1b shows the problems for 18

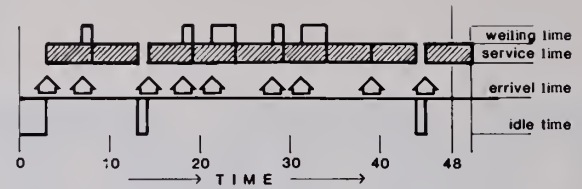


Fig. 1 (a) — This figure shows the effect of irregular arrival times on a fixed length service. Nine patients arrive at random intervals in the first hour in the morning at an office for a fixed 5 minute treatment. Arrival time is shown by the open arrows. The treatment period is indicated by the cross-hatched bars above the heavy line. Waiting time is shown as open bars above the cross-hatched bars. Unused time is shown by the open bars below the heavy line. If we assume a total planned treatment period of 48 minutes for $9 \times 5 = 45$ minutes of treatment, then we see that the utilization rate was 89.6%. Despite 9 minutes unused, 18% of the time another patient was waiting, and the last patient went overtime.

patients requiring 100 days of hospital care in a single bed unit. There is 89% utilization. There were 79 days of patient waiting and $\frac{3}{18}$ patients unserved at the end of 100 days. It is at this point where there is a close match of demand rate relative to service rate which requires the most careful analysis in queuing problems. Marginal changes will produce dramatic improvement or deterioration depending on whether service capabilities are increased or diminished.

What are the General Features of Queues which We can Apply to Hospital Facilities?

Queuing theory was started in 1909 by A. K. Erlang⁷ a Danish engineer with the Copenhagen telephone exchange. He analyzed the problems of callers waiting in turn (queues) for a limited number of telephone circuits. Our major U.S. telephone company (Bell laboratories) and other phone systems are the long-term corporate sponsors of operations research in queuing problems.⁸⁻¹⁰ The results of queuing research have been effectively applied in solving problems in rail yards¹¹, aircraft factories¹², toll booths¹³, machine shops¹⁴, and is a major consideration in businesses as diverse as computer service bureaus and high-traffic fast food franchises.

Five features define a queuing situation^{6,15}.

1. There are customers, clients, patients, trains, machines, or airplanes, etc. which are arriving at a facility seeking some service.
2. There exists one or more gates, counters, or service channels. The service facility may have several channels in parallel or in sequence.
3. There are input processes which govern the arrival of clients. Arrivals may range from purely random to completely regular.
4. There should be some queue discipline, either the first-come-first-served rule or any other system of

*Some friends in industry comment that their management efficiencies can be imposed on medicine. Most of the manufacturers have had experience making one or at most, several closely related products in the same manufacturing category (electronics, machine tools, etc.). They many times do not see the complexity of medical care. There is a tendency to think that "heart trouble" is uniform and has a single program of management. They are more understanding when the hospital's problems are couched in terms of a production analogy. If we think of a larger hospital in manufacturing terms, we see that on any one day, there are 500-700 custom-made treatments in progress for one or more diseases from a list of 20,000 different diseases. Physicians are not always sure of the problem but must work from "best probability" estimates in "production planning." To these patients, we select and apply some 10,000 procedures, tests, therapies, and maneuvers. Each "product" is uniquely engineered never to be repeated in exactly the same way. Furthermore, the specifications of the "product" are altered depending on results and responses to all prior procedures and therapies. The possible combinations are infinite. Production time is altered frequently. Specifications are changed at least twice a day when the doctor makes rounds. Merely mobilizing the appropriately trained personnel and tracking the shifting moment-to-moment care pattern would swamp any usual manufacturing plant. The medical care problem is many orders of magnitude more complex than assembling 60 similar components of a single circuit board and running it through a float-solder machine for the 10,000th repetitive cycle.

priority of service.

5. There is a service mechanism which acts upon an arriving client and then discharges the client. The service time may be completely variable.

A system can be further defined by: (a) Length of the waiting line; (b) Average waiting time for clients; (c) Number of service channels used; (d) Average time a unit spends in a system.

By now, the analogies to hospitals service are obvious. Patients are our clients and a service unit can be defined as a "bed" (for simplicity, a "bed" represents one complete service channel with all supportive diagnostic and therapeutic functions).

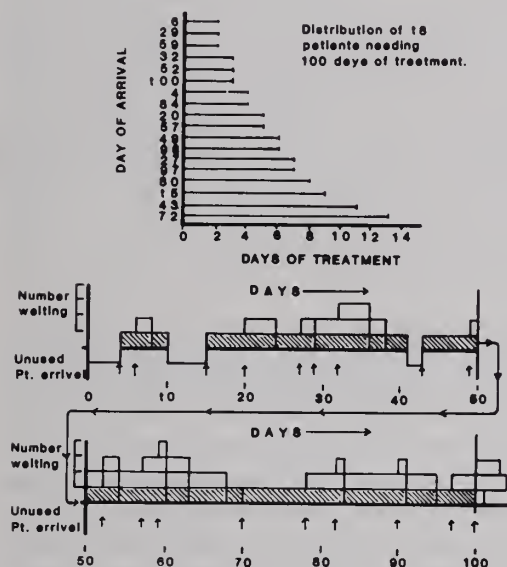


Fig. 1 (b) — This figure shows what happens when both arrival time and service duration are randomly varied at high utilization rates. The example is structured so that 18 patients need a total of 100 days of hospital care in a single bed. The duration of hospital stay varies for each, as shown in the upper part of the figure. This roughly approximates a Poisson distribution. The interval between successive arrivals followed the same distribution frequency. The order of patient arrival was assigned from a random number sequence. The 100 day period is divided into 2 lines. The days are indicated along the baseline. The time of patient arrival is shown by the small arrows. Unused time is shown by open bars below the heavy time line. Treatment periods are represented by the cross-hatched bars. The number of patients and the period of waiting is shown by the open bars above the cross-hatched bars. It is typical where there is a fixed starting point that there are some unused gaps near the start. This results in some wasted time (utilization = 89%). As the time progresses, a waiting line becomes the rule rather than the exception (there are 79 patient-days of waiting). At the end of 100 days, 1 patient is still under treatment and 2 are still waiting and unserved. If we extend the process an additional 100 to 200 days, some additional gaps occur and the waiting lines become longer. With random arrival and random treatment times, waiting lines will form and enlarge at high utilization levels.

Hospital Model of a Queuing System

Length of Service or length of hospital stay may vary. Delays may arise in a more-or-less random fashion depending on diagnoses, other medical conditions, or complications. The total acute hospital days of care fluctuate $\pm 7\%$ in wide metropolitan areas on a month-to-month basis⁴. The variation of length of stay of arrivals for an acute medical-surgical bed approximates a Poisson distribution (Figure 2). Variations of stay on other special services may not be normally distributed (Figure 3). When there is a mix of random and regular arrivals, it is called an Erlang distribution. In most real-life situations an Erlang distribution is found.¹⁶

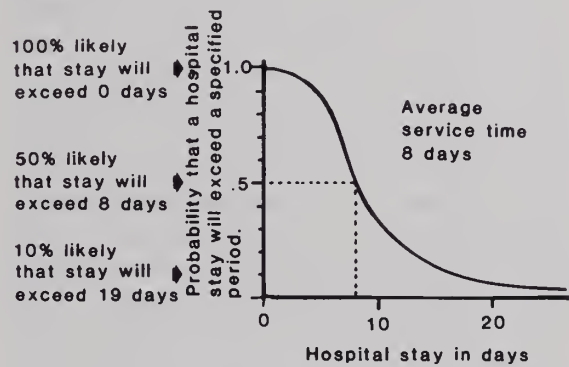


Fig. 2 — Over a period of time, a service with a variable period of stay will have a measurable distribution. In an acute medical-surgical service it will probably come close to a Poisson distribution. The example shows a typical example of length of stay data with 8 days as the mean stay. For individual patients the stay will usually be shorter or longer than 8 days. For each arriving patient, there will also be an average gap between consecutive arrivals.

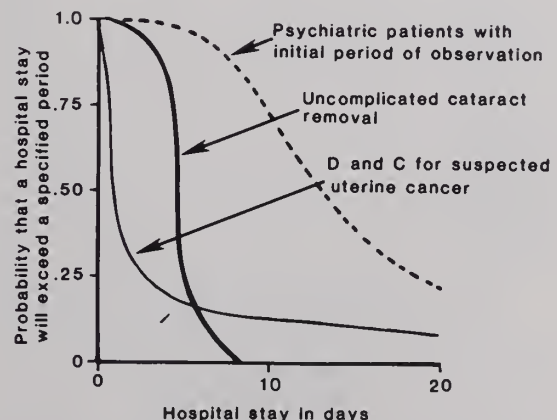


Fig. 3 — In certain clinical circumstances the distributions of length of hospital stay may have non-random distribution for certain specialized functions.

The values calculated for a single bed model (Appendix. Formulae 1 are shown in Figure 4 for utilization from 0.1 (10% utilization) to 1.0 (which is 100% utilization). With irregular patient arrivals and irregular service times, you can see that patients may sometimes wait for a bed. There are three chances in a hundred that three people may be waiting for a bed (in a care program with only one bed) when over a period, the utilization rate may be only 50% (Table. See last page of article). When utilization in a single channel system reaches 0.8, a small rise in requests for the bed will result in a sharp rise in the length of the waiting list and hence increase average waiting time. This explains the rapidity of back-up in a one-man office which is tightly scheduled. This phenomenon extends to utilization arguments surrounding C.A.T. scanner scheduling problems. Later, we will see what happens in a multichannel system, but for now, we can make three observations from this simpler model. First: At higher levels of system utilization there is a direct trade off of increased utilization rate for an increase in the length of waiting lines. Second: There is a critical point at 70% to 80% utilization where lines begin to develop rapidly. Third: Above 90% utilization, the rate of growth of waiting lines is precipitous. The waiting time for service is excessive. Patients who have other options will seek care elsewhere or leave the "health care line". The abandonment of the queue may be salutary in containing cost but disastrous to quality patient's care.

Effect of Priority

Priorities can be assigned in queues. Morse showed

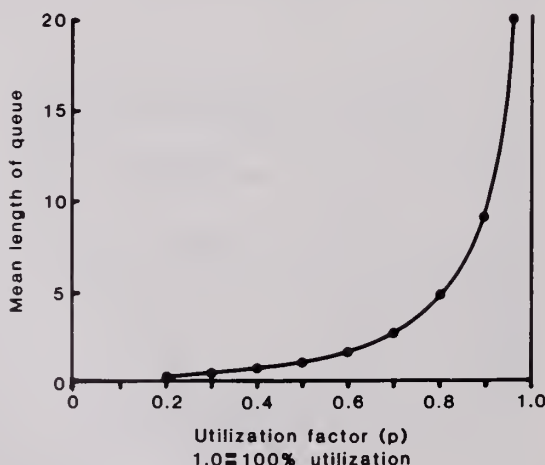


Fig. 4 — This is a linear plot of the length-of-queue data (single service channel calculated from Formulae 1, appendix). This is clearly an exponential curve. As the utilization rate exceeds 80%, there is a precipitous rise in length of queue.

that for a given utilization factor, a system serving a mixed group is less efficient than a system serving a group with a fixed service time.¹⁶ If the major consideration is to minimize the total number waiting at a high utilization rate, then, one should give highest priority to those cases which tend to require a shorter service time¹⁶. Favoring patients which tend to have shorter stays will reduce the likelihood of overlapping multiple arrivals during a prolonged service period i.e., there can be a tighter schedule packing. An emphasis on short-stay cases does explain why some proprietary specialty hospitals can enjoy high utilization with the economic benefits. All you have to do is cater to specialists who traditionally have short stay patients. Then, exclude severe acute trauma, eliminate complex thoracic cases or discourage admissions from staff who have a practice dealing with complex cancer or degenerative disease. The contrary pattern is found in many hospitals, particularly those providing the broadest service. In some of the hospitals which planners identify as "less efficient" the severely ill, complex, long-stay patient is regularly given priority. This is medically correct but diminishes utilization rate.

What happens when Transient Peak Demand for Service is Superimposed on a Steady Load?

For an example we can use our "single bed unit", perhaps a special purpose minor surgery bed in the emergency room of a resort area hospital. In this unit, a minor procedure is done and the patient remains until recovered. Suppose that 1 patient per day uses it for an average of 18 hours/patient. This is a utilization factor of .75. Suddenly for a 60 day period in summer there is a double the average request rate to two patients/day for 18 hrs/patient (Utilization factor = 1.5). Since all patients can't be accommodated, a waiting list is started. If all the patients were to wait in a queue, by the end of 60 days there would be 42 patients on the list. Further, if the request for service rate abruptly dropped back to a more normal .75 rate, it would take an additional 120 days to work through the waiting list. The methods of calculation can be found in Chapter 3 of Cox and Smith¹⁵. The example is oversimplified, but the message is clear. Peaks of service demand will tend to create persistently long queues. "The object of queuing theory is to show whether a transition from self-aggravation to self-amelioration is at all possible and, if so, how to bring it about in the most economical manner⁶." Singh emphasizes (by using a number of non-medical examples) that it is economically better to reduce queue length by removing minor bottle-necks within the

system service-cycle⁶. In our example, cutting the service time from 18 to less than 12 hours would solve the problem. Perhaps providing a recovery area or minimizing instrument cleaning and sterilization time would speed the service. When utilization rates are in the high range, the key is to provide a faster mean service time which will directly reduce utilization rate thus moving a waiting queue back from the rapidly rising portion of an exponential curve (Figure 4).

What Happens when the Total Service Program Occurs in a Sequence of Serial Operations where a Queue Can Develop for each Subservice?

Within hospitals, there are many places where sub-queues may develop for particular services. Figure 5 shows some of the many places within a hospital where queues may develop in the flow of surgical patients through the service system. In a simple form where the sequence (queue #1) → (Service #1) → (queue #2) → (Service #2) occurs in an operational setting, Morse has derived the formulas for this simple 2 station arrangement¹⁶. These are shown in the appendix, Formulae II.

In this simple set up, the maximum utilization (when ρ is a very large number) of the system is $\frac{3}{4}$ (.75). (From Formulae II where equation 2 is solved for $\rho =$ a large number). If one examines a similar system where no queue is allowed before station 2, utilization deteriorates to $\frac{2}{3}$ (.66). There are many sequential service chains in most hospitals similar to Figure 5. The effect of such service chains is clear — utilization will not reach 100% but will tend to be at or below a 75% maximum when patients must traverse a simple sequential chain of services with irregular processing times and the possibility of developing waiting lines¹⁷. Industrial planners have developed delay tables and utilization tables which are calculated for many parameters⁹. Such tables are the

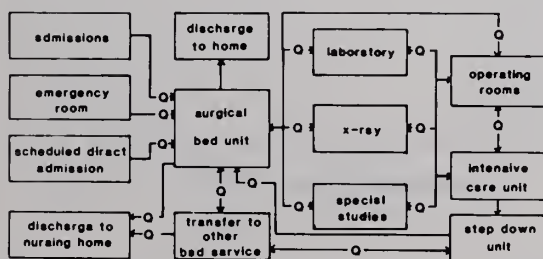


Fig. 5 — This figure calls attention to some of the hospital areas a surgical patient must traverse in the course of "routine" care. Everywhere a letter "Q" appears in an arrow, there is the potential for a waiting line or waiting list to develop. Having a delay in one link of an essential chain of care will reflect itself in queues developing before scheduled admissions and in the other routes of admission.

handbooks of telephone systems planners. Perhaps similar tables should be produced for hospital systems planning.

What Happens when Multiple Parallel Service Channels are added?

Hospitals have multiple, not single beds. In larger hospitals there are bed areas with special construction, equipment and functions. This would include nurseries, intensive care units, psychiatric wards, obstetrical wards, etc.

The multiple service channels for queuing purposes are those service channels which are functionally interchangeable. In the hospital, a multiple trauma patient cannot be admitted to a nursery "bed". You would have to postulate bizarre circumstances in order to appropriately admit an obstetrical patient to coronary care unit. For clarity we should divide a hospital into an acute Medical-Surgical Section and a number of smaller special function sections, each with their own group of service channels for a particular client population. Since the Medical-Surgical section is the largest, we can examine the effects of queuing under the following conditions; (1) Patients arrive in a random manner which is at, or above, the mean service rate of the facility. (2) Allow an infinitely long waiting list to accumulate. (3) Any arriving medical-surgical patient can be cared for in any medical-surgical bed. (4) There are a varying number of single-function channels without embedded serial queues. In essence we are going from one simple service channel to multiple simple service channels in parallel.

In Figures 6 and 7 the effects of the number of beds is plotted against utilization. Both the size of the waiting line (Figure 6) and the likelihood that there will be a bed waiting (Figure 7) are shown (Formulae III). It is clear that as the number of beds is increased, we can get higher utilization rates before the service channels become saturated.

In medical terms, the plots in Figures 6 and 7 mean that a functional hospital unit with more beds can operate closer to 100% utilization than a smaller hospital. A small community hospital of 30-40 beds could be perceived as "busy" when it has an A.D.C. in the 65-75% range.

It is clear from Figures 6 and 7 that adding more channels will reduce waiting time for a given level of utilization. However, if we increase interchangeable service channels to 128, there is still a precipitous rise at 85% utilization. At any bed number (M) (Figure 6), the waiting line is infinitely long at 100% utilization.

When planners set standards for hospital bed utili-

zation, it is extremely important to examine the area in the 80-100% utilization range. One way to approach 90% utilization with a minimum wait would be to have an extremely large number of totally interchangeable beds (>1000 interchangeable service channels) serving a very large patient population. Managing a huge hospital is difficult in a present day medical setting. We must then evaluate what levels are realistically achievable for existing hospitals. Where the number of beds is in a functional range of 100-300 (any patient can go into any service channel) then a best-case utilization rate of 80% to 90% would engender frequent short waits for service. This best-case circumstance would only be true if: (a) $M = >100$ interchangeable beds for each functional hospital unit. (b) Load rate was steady and had a relatively random arrival. (c) No sudden peak demand for service occurred. (d) Service times were not adversely inhibited by internal bottle-necks in serial waiting lines in the service channels.

It is important to note that where a hospital has a functional bed unit which is not interchangeable with other service units then it must be treated as a discrete aggregate of service channels. By examining Figure 7, it can be seen that for a discrete 8 bed unit, such as an I.C.U., there will be many times when a bed is unavailable when utilization rate averages 70-75%.

Hospital services are characterized by peaks-and-valleys of demand. The author has previously commented on the various seasonal effects on operating room scheduling.¹⁸ Such things as change in weather, local epidemics of respiratory illness, even the opening of fishing and hunting season alter the number of patients seeking surgical care by as much as 20% in a large urban referral hospital. Area-wide studies confirm wide seasonal fluctuation.⁴

Comments

The five factors of irregular patterns of patient arrival; varying periods of hospital stay; daily, weekly, and monthly loads which are unsteady; sequential waiting lines within hospitals; and non-interchangeable bed sections, all diminish maximum achievable hospital utilization.¹⁹ The most apparent lesson in applying a queuing analysis is that utilization rates approaching 100% for hospital care are not practical if quality health care services are to be maintained. Pressing for utilization above 90% would be expected to produce: (a) Waiting lists for elective care measured in years. (b) Marginal availability of an emergency or high priority bed. (c) Patients leaving the long waiting lists for "no care," or some other marginal medical system. For the affluent, another

freely operating system would likely develop in parallel to the controlled system. (d) A certain number of patients will succumb to their disease or to incidents of chance while waiting for care. This would produce some cost savings but accomplish the savings with callous denial of care. (e) In delaying the medical care of some diseases, the patients who finally get to the head of the queue for service may require a much

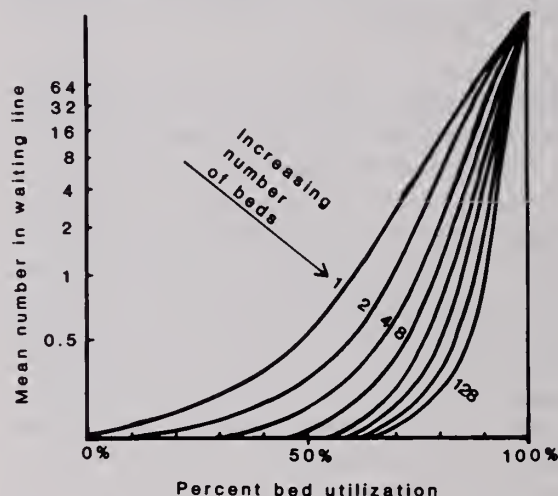


Fig. 6 — This is a plot of mean number in the waiting line as utilization is increased and as the number of beds are increased (Calculated from the appendix formulae. Note that the vertical axis is logarithmic). As bed numbers increase in a geometric progression, they can come closer to a high utilization for the same length queue. The area from 70% to 100% utilization has a steep rise in waiting line length with minimum change in utilization.

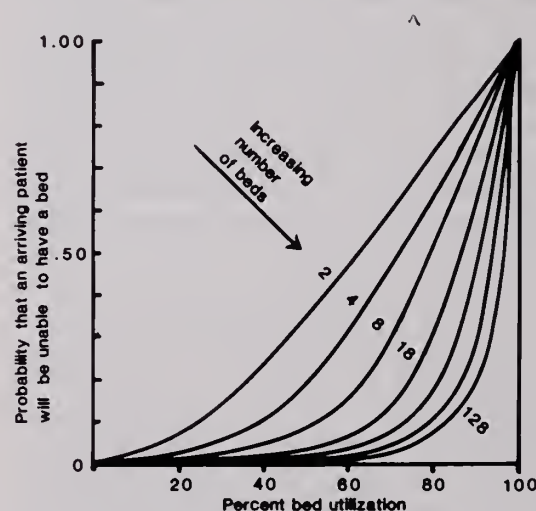


Fig. 7 — This plot is expressed as the likelihood that an arriving patient will be unable to have a bed in a unit of different sizes at differing levels of utilization. At 80% to 100% utilization for a moderate bed unit the system is sensitive to small increases in utilization. If utilization averages 80% with a 10% random variation from time-to-time, there will be frequent periods when having a bed for an emergency admission will only be a 50-50 probability.

longer and more expensive service period. Some medical models in other countries suggest that when "control forces" push very high utilization rates the scenario may be real.

The exponential rate of waiting times in queues at high utilization rates is certainly not speculative. It occurs in system after system.

It is crucially important for regional hospital planning to distinguish efficiency from utilization. A better cost-saving queue-shortening approach in any industrial model operating above 70% of capacity is to make the system more efficient so that processing time in a channel is reduced. The greatest improvement occurs because of many small ad hoc last minute adjustments which require individual effort within a hospital staff.

Conclusions

Analysis of hospital care is more complex than the usual industrial models. If planning agencies are going to exert control on health care systems, they should require a sufficiently detailed data base. They must then apply the best scientific discipline and numerical dimensions that are available to operations analysis. 100% utilization of a heterogenous system cannot be achieved. Levels above 80-85% will produce frequent waiting lists under best of circumstances and extended waiting lists under irregular loading. If resources are going to be constrained, there must first be a decision about what size waiting lines will be acceptable and what delay of medical care can be tolerated. A valid measure of utilization must be used, not average daily census/366. When this is done then one can use some queuing techniques to improve estimates of optimum resources. Queuing theory would suggest that improvement in productivity will be better accomplished by focusing on removing small "bottlenecks" which retard service rather than insisting on large consolidated bed units. Effort should be directed to "smoothing hospital loads" with scheduling of elective care. In the end we could borrow the thought that "the notion that productivity may be dependent upon trust, subtlety, intimacy, for example, probably seems strange to most people."²⁰

Appendix

Formulae I — For Average Waiting Time

From client arrival and service data we can calculate the average gap between two consecutive arrivals (α). You can find the service time for the average single client (β). The utilization factor for a single channel will be

$$\rho = \frac{\beta}{\alpha} = \frac{\text{Average service time of a single client}}{\text{Average gap between two consecutive arrivals}}$$

From a knowledge of these two values we can see that:

$$\text{Average size of queue} = \frac{\rho}{(1-\rho)} = \frac{\text{utilization factor}}{1 - \text{utilization factor}}$$

The likelihood that a queue will exceed some number (n) is expressed as:

$$\text{Probability that queue} > n = \rho^{n+1}$$

The average waiting time will be the time necessary to serve the average patient, times the size of the queue.

$$\text{Average waiting time} = \beta \frac{\rho}{1-\rho}$$

Formulae II — Calculations For a Two Station System

The figures at the right show the values for (L) (B) and (F) where:

$$\frac{\text{mean arrival rate}}{\text{mean service rate}} = \rho = \text{utilization factor}$$

is allowed to vary from a very small number to a very large number.

- | | | | |
|-----|---|--|--------------------------|
| (1) | The mean number in the system | (L) = $(\rho^3 + 12\rho^2 + 8\rho)/S = \frac{29}{25}$ ($\rho = 1$) | 2ρ ($\rho << 1$) |
| | | $\frac{9}{4}$ ($\rho >> 1$) | |
| (2) | Mean number stations busy | (B) = $6\rho^3 + 10\rho^2 + 8\rho/S = \frac{24}{25}$ ($\rho = 1$) | 2ρ ($\rho << 1$) |
| | | $\frac{3}{2}$ ($\rho >> 1$) | |
| (3) | Fraction of clients who must be turned away | (F) = $(4\rho^3 + 5\rho^2 + 4\rho)/S = \frac{13}{25}$ ($\rho = 1$) | ρ^2 ($\rho << 1$) |
| | | $1\frac{3}{4}$ ($\rho >> 1$) | |

$$(4) \quad T_1 = T_2 = \frac{1}{2}B = (\frac{1}{2})(\frac{3}{2}) = \frac{3}{4}$$

where: S = a constant factor so that the sum of all the probabilities is unity = $3\rho^2 + 4\rho + 2$

ρ = Utilization factor

T_1 = Fraction of time station 1 is busy

T_2 = Fraction station 2 is busy.

for this example, service time of station 1 = Service time of station 2

Formulae III — Calculation of Queue Length With Increasing Number of Beds

The probability that the queue is as long or longer than some length N is:¹⁶

$$L_q = \rho e_M (\rho M) / (1 - \rho) D_{M+1} (\rho^M)$$

where: L_q = Mean number in the waiting line.

$$\rho = \text{Utilization factor} = \frac{\text{Mean arrival rate}}{\text{Mean service rate}}$$

D_M = A Poisson integral function.

e = 2.71828 (base of natural logarithms)

M = Number of service channels = Beds

If we take a series of utilization rates for different numbers of service channels (M = Beds) we can calculate a family of curves seen in Figure 6 which gives us the mean number of patients waiting in line for admission as utilization rates rise for increasing numbers of beds.

You can also calculate the probability (Q) that all service channels (beds) are busy and occupied as a function of utilization rate (ρ), the number of beds (M) and the maximum number allowed in the system (N). This is given by the equation below.

$$Q = \rho N e_M (\rho^M) / D_{M+1} (\rho^M)$$

The curves in Figure 7 are derived when a series of values of utilization rate and beds (M) are plotted.

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TABLE

Utilization factor (ρ)	Probability that service counter is free or idle ($1-\rho$)	Average Queue Size	Average Waiting Time	Probability of queue size exceeding 4 & 9	
		$\frac{\rho}{1-\rho}$	$\beta \frac{\rho}{1-\rho}$	4	9
				(ρ^5)	(ρ^{10})
0.1	0.9	0.111	0.111 β	0.000	0.000
0.2	0.8	0.250	0.250 β	0.000	0.000
0.3	0.7	0.429	0.429 β	0.002	0.000
0.4	0.6	0.667	0.667 β	0.010	0.000
0.5	0.5	1.000	1.000 β	0.031	0.001
0.6	0.4	1.500	1.500 β	0.077	0.006
0.7	0.3	2.333	2.333 β	0.168	0.028
0.8	0.2	4.000	4.000 β	0.327	0.107
0.9	0.1	9.000	9.000 β	0.590	0.348
1.0	0.0	Infinity	Infinity	1.000	1.000

The Changing Health Care Environment†

S. R. MAXEINER, JR., M.D.*

YOUR INVITATION TO ME to speak to you about our changing environment in health care recognizes the position of my Hennepin County Medical Society at the advancing edge of the storm front. Whether we are being swept away, or are succeeding in building shelter, remains to be seen. I will tell you of some of the developments in our area, and of some of the lessons learned.

There are many reasons why our metropolitan community of Minneapolis-St. Paul is fertile ground for social and medical change. We have a strong populist sense, and a long liberal political tradition, which I think reached its zenith in the person of Hubert Humphrey. In the 1950s we mobilized community zeal and resources in a mammoth hospital construction program. In the 1970s we found we had too many hospital beds. Aggressive management developed from the effort to support these beds and to develop new, high-tech ancillary facilities. Our medical community, strongly supported by extensive teaching programs, has expanded steadily, and maintains a very high standard of competence. Several large multispecialty clinics were founded, and have prospered. Like many communities of our land, we now face an apparent oversupply of physicians. In an organizational level, we have had a strong and active county medical society which has taken the lead to develop, among other things, a Foundation for Health Care Evaluation to serve as an impartial monitor and evaluator of health care, an IPA Model HMO, and many close working relationships with citizen groups interested in health care.

The industrial/commercial segment of our community also contributes to our progressiveness. Enlightened business leaders are concerned about the costs their companies incur in providing health care to their employees. Many of these leaders enjoy the autonomy of home-office status. Many have contributed their concern and their leadership through the Citizen's League and the Minnesota Coalition on Health Care Costs. Add in other citizen groups like

the Council on Community Hospitals, the Physician Metro Task Force, the Senior Federation, the Metropolitan Health Board, and the presence in Minneapolis of nationally oriented health planners and tank-thinkers. When these ingredients are all stirred together, they make a bubbly cauldron.

As you well know, the heat under this cook-pot is supplied by the way people feel about the costs of health care. Although the reasons for these costs are not our subject here, let us just note that major cost increases are occurring because of new technology (which no one wants to do without), and because of the postponement of death (which coming sooner would effectively prevent further expenses).

So, out of this community cauldron simmering over the economic fires, what concoctions come forth?

First of all, the traditional, fee-for-service practitioner has not disappeared. Even a year ago, he seemed unchanged and unchanging, autonomous and individual. He often ignored the storm clouds around him. He had *his* patients, and *his* hospital, and *his* way of doing things. Today he seems different. He may have empty spots in his appointment book, and he may have some doubts about the future. Look what he is dealing with. He submits forms to several different insurance companies, especially the Blues and indemnity plans. His fees for some patients may be partially disallowed by third parties. His office practice is measured for costs per call and costs per year. When he wants to admit a patient to a hospital he may first need authorization from the insurance carrier. He may be told that the service he plans can be done quite nicely on an outpatient basis. If he violates any of the rules, he may find his patient disqualified for benefits. The most remarkable change of all is that he sees all of these restraints and strictures, which he railed at a year or so ago, as his best friend for the preservation of his way of life.

Another product of our cauldron is the Health Maintenance Organization (HMO). The HMO is a risk-taking entity that collects premium income from its prepaid subscribers and undertakes to provide all the health care services they need out of that pool of money. If the HMO is unlucky enough to have a few disasters, it needs to be far-sighted enough to have

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†Read before the Memphis and Shelby County Medical Society, Memphis, May 2, 1983.

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reinsurance. The advantage of large numbers of subscribers is easy to see, so that big hazards can be leveled off in broad-based averages.

HMOs negotiate rates and terms with hospitals and pharmacies. The terms can be anything legal within an entrepreneurial framework, and may be difficult for outsiders to learn about, but known or unknown, they will influence the relationships of these facilities to all physicians and all patients. Cost-shifting can be important here as it is with the Medicare system.

Physician services must be provided by the HMO, and various ways to do this are found. The primary care physician may be paid by fee-for-service, or he may contract to provide all needed care, great or small, for a fixed annual fee per patient. He may even be employed full time by the HMO, seeing no patients outside the plan, and receiving wages and benefits. Secondary care may be provided by full-time employees or by outside consultants. Less frequently utilized specialties and superspecialties will usually require outside consultants charging fee-for-service. Their rates may be negotiated in advance, before they are asked to work for the HMO. The advantage is obvious for a plan to have its own organized medical staff, with centralized communications, policies, and management disciplines. This description fits the multispecialty clinic. It is entirely possible for a traditional, fee-for-service, multispecialty clinic to serve an HMO plan as well. We have two examples of that relationship in Minneapolis.

Any of these payment arrangements that are *not* fee-for-service give immediate incentives to the physician to control costs by limiting service. Underutilization, or withholding of needed services, is an obvious danger. We have not seen evidence of it in our city to date.

What has happened in the Twin Cities as HMOs emerge from the cauldron? *Plenty*. In 1972 we had one HMO serving 3% of our population. In 1983 we have seven, serving 500,000 people or 25% of our population. Most HMO marketing is done through major employers. In these markets, the HMOs have achieved nearly 80% penetration. New programs are now selling HMOs to Medicare patients, and they, too, are flocking in and signing up. These plans are well advertised, and offer all the care you want for a fixed cost — no surprises. People like them.

Another creature out of the cauldron is really one of the seven HMOs, but is unique. It is an IPA model of HMO, or Independent Physicians' Association. It was formed by and from the Hennepin County Medical Society, under the name of Physicians' Health Plan, or PHP. It functions as an HMO, but has

a huge roster of independent participating physicians representing the large majority of private-practice HCMS members. Physicians are paid by fee-for-service, and totally by the Plan. No charges are made to the patient.

PHP merits some discussion because of the steps in its evaluation. The Plan was started in 1975. It sold contracts at a premium slightly higher than those of competing HMOs (and still does). But the other HMOs were paying for 400 hospital days per 1,000 subscribers per year. PHP faced claims exceeding 800 hospital days per 1,000 per year, as well as the physician fees to go with them. *Red Ink*. Answer: utilization control. Management imposes controls on physicians. Today PHP contracts require certain procedures to be done out of hospital, surgical admissions on the morning of surgery, preauthorization for all elective hospital admissions, and concurrent review of hospitalized patients relative to reason for admission, length of stay, discharge planning, and utilization of all treatment modalities. Special controls are exercised over mental health services, chemical dependency treatment, cosmetic surgery, and pharmacy. These controls are imposed by the Plan on the physicians, and have evoked some outrage and much hostility. But last year, PHP claims were in the range of 400 hospital days per 1,000 subscribers. *No Red Ink*.

In addition, the Plan has devised ways to make the mechanism of physician reimbursement function as an incentive for cost effectiveness. Fees are reviewed, and possibly reduced to conform to an unpublished maximum schedule. Of the approved fees, 20% are held back to year-end. Physicians risk losing this 20%, for it will be used to offset any operating deficits. In recent years, with utilization under control and the Plan in the black, these funds have been appropriately distributed to the waiting physicians.

Now there is a new wrinkle. PHP maintains utilization records for the performance of individual physicians, both in hospital and in office. High costs per hospital procedure, or high cost per patient office visit, or high aggregate cost per patient per year will trigger a review of the individual physician's practices. Unexplained high costs may deprive that individual physician of his share in the 20% withheld. In a few instances, these high-consumption physicians have left the Plan. In most instances they have modified their behavior.

There is a distinct difference in the way these two kinds of HMO affect the communities in which they grow. The IPA model serves patients via independent practitioners who live there anyway. The staff model

HMO is more apt to hire its full-time physicians from outside the community and bring them in. To that extent it is effectively reducing the market population for the existing medical community. In that sense, as far as my practice is concerned, 400,000 people have moved out of town.

Will patients sign up for something like this? Will they really give up their own physicians or their freedom to choose a personal physician? The answer is: *YES*, for the dollar. It is common in the Twin Cities for physicians to be asked to deliver to a prepaid system medical records of established patients of long standing. Loyalty is a thin buffer. HMOs attract not strangers only.

There is, however, an interesting bias in this — a phenomenon called *adverse selection*. People who are well and expect to stay well look kindly on the chance to put a cap on possible health expenses. They are likely to sign up for HMO coverage. People who are chronically ill and likely to need continuing treatment are most likely to stay with their existing physician relationships. This bias produces a definite added burden to the indemnity insurance carrier, and also to the IPA model HMO, for they draw a greater than random share of the high-risk population.

If someone comes to your town and absorbs 10% or 15% or more of your population, how do you respond? Some ways are illegal, or unprofessional. Another idea is to compete. Join or form a marketing group that will present your services to the public for possible purchase. This is the incentive for physicians to join the next member of the alternative delivery system, the *Preferred Provider Organization*. PPOs are pretty new — so new that even the Twin Cities haven't really got one yet. We know of seven or eight in formation. They vary. Each one will be different in details of management, of sponsorship, of payment mechanisms, and of utilization review and quality control. You have to inspect the terms, and be critical. In general a PPO is a brokerage operation. The central entity may be anybody; it can be for profit, and can be kept rather simple. For a small sprinkle from the cash flow, its function is to bring together the other players.

It attracts *employees* to sign up by offering health care coverage at a favorable cost from a large panel of physicians and hospitals convenient and well-known to prospective patients. Employees also have the option to go outside the panel for their care, but they will incur personal expense as co-payors if they do. The broker attracts *employers* to the plan by offering cost-effective health care, possibly even measurable cost savings. The employer who chooses to be self-

insured rather than buy insurance coverage pays only for expenses actually incurred. He is freed from the cash-flow drain of the capitation fees that would be prepaid to an HMO plan. The broker's selling points to the employer-sponsor include the plan's claim to provide effective utilization controls, and the plan's negotiated rates with physicians, pharmacies, and hospitals. Negotiated rates are agreed on in the contracts of participation, and are likely to be discounted rates. Despite those discounts, the broker attracts *physicians and other providers* into the plan by offering an increase in patient volume and prompt payment of claims.

Why are the lucky providers described as "Preferred?" First, the plan gives patients a dollar incentive to select these designated providers rather than others not in the plan. Second, the preferred providers are (or are claimed to be) more cost effective than others in the community. Third, the plan has negotiated rates with them, usually with some discount.

We have discussed HMOs and PPOs. Let me review some of the differences between them. Remember there are many variables, and distinctions may blur. The HMO collects its money by capitation — a flat rate per enrollee — and assumes the risks of adverse claims experience. The PPO collects its money as a fee, a percentage of expenses actually incurred; it assumes no risk. The self-insured employer-sponsor, or an insurance company, bears the risks of adverse claims experience. The HMO pays its physicians by fee, by flat rate, or by salary. The PPO doesn't pay its physicians at all; it just passes along someone else's money, in accordance with a previously negotiated schedule. The HMO actually provides the service, but locks the patient into a "where" and a "when" and a "by whom." The PPO allows the patient to choose both his circumstances of care and his physician; it just reminds the patient that he will pay a whole lot less if he chooses a preferred provider.

These plans, whatever their initials may be, are individual and variable. Examine them critically. Make no assumptions of beneficence toward the physician nor toward the patient. Take not quality for granted. These plans are being developed out of economic pressure. Their creators may not even be aware of the unique values that lie at the heart of the health care system. Physicians need to protect their own economic interest; it is legitimate to do so. But we have also a professional and ethical duty to protect the patient. No one else really can, and some of the others are not dedicated to patient welfare. I am convinced about the primary issue physicians must address in

looking at alternate delivery systems. It is vital that this function of assessment and assurance of the quality of care be maintained in physician hands.

Now if a PPO plan or an HMO plan begins to operate, its success will depend on its control of costs. Expensive treatments, extra laboratory tests, unnecessary hospitalization are anathema. The plan has an immediate need to know which physicians are good purchasing agents for health care, and which are high-profile, high-consumption, expensive providers (even if their fees are reasonable). Who is to say which health care costs are high profile and which are essential to good quality of care? Think that over. If you think, as I do, that that is an essential role for physicians to play, be prepared to fight for it, or lose it.

So, no battle is ever really won. Eternal vigilance is the price of freedom, and apparently of quality in health care. Life is a process and lessons can be learned along the way.

- *Fertilizer feeds the flowers and the weeds alike.* Nearly universal health care coverage, first dollar coverage, cost-plus hospital reimbursement, and third-party payment to physicians have generated an enormous expansion in health care that is outgrowing its money supply.

- *You can't sweep back the tide with a broom.* Retrenchment of the health care system is going to happen somehow. Alternative delivery systems, including HMOs, IPAs, PPOs, are just part of the phenomenon. Just wait for DRGs!

- *It's better to light one candle than to curse the darkness.* The county medical society can play an active role in leadership. Members want that nowadays, and respond. Membership should include all

kinds of physicians, no matter who pays them, and the society should champion those essential transcendent values that should characterize our profession.

- *Everybody learns to serve the public in a way that also benefits himself.* Physicians are slow to change. Conduct can be modified when the consequences are definitive. Utilization controls must be iron clad; then they can be effective. Payment incentives work.

- *Motherhood and apple pie rank just behind quality of health care in getting lip service.* The truth is that many of the actors in the current scene are willing to throw quality away. To take it for granted could mean to lose it. Assessment and assurance of quality of health care control must be kept in physicians' hands, not because it is their prerogative, but because there is no one else who is trained to make these judgments to the benefit of patients.

- *The hand that holds the dollar writes the rules.* The health care system responds with sensitivity to financial incentives. Patients desert their own physicians to save a dollar. Physicians play by rules that others write for reimbursement. Hospitals will turn inside out over prospective payments. Advertising becomes respectable. The ultimate power lies in federal laws yet to be written.

How good it is that we serve a profession where we need not measure our success only in dollars gained. People need us. Some are even grateful for what we do. We are still permitted to harbor for our profession a vision that transcends the dollar[^] and serves the public trust. I hope we will work and fight for that vision.

MINNESOTA MEDICINE Covers

In order to select the best cover pictures for MINNESOTA MEDICINE the cover editor requests that all amateur photographers search slide collections and submit more pictures. The appreciation of beauty is always quite subjective, whereas the selector might find a different picture desirable for the cover. Such factors as the background, the amount of lighting, and the presence of extraneous background images on the slide may make a cover selection less desirable. It is suggested that several of your better pictures be submitted for consideration in the hopes that one might be chosen. Currently the cover editor is in need of photographs starting with next November's edition which would include late fall and winter scenes. It is requested that vertically positioned slides be submitted at this time in order to try a changed cover format.

Bruce Nydahl, M.D.
Cover Editor

Effects of Economic Trends on Hospital Medical Practice

H. DAWES MILLER, M.D.*

Increasingly severe economic stress will affect hospitals over the next several years. Price competition and prospective payment have placed physicians and hospital administrators potentially on a collision course. In order to survive, unified goals for patient care need to be developed by hospitals and their medical staffs. Hospital medical staffs will need to develop strong organizations in order to address these issues effectively.

IN THE PAST, the practice of medicine has been relatively isolated from cost constraints. Hospitals, and even third party payors, have supported the cost of medical decisions, without being particularly restrictive. Patients and physicians have felt isolated from the costs of care, as a result of liberal benefits provided by employers or by the Federal Government. The result has been an increase in the level of services provided to patients, an increase in the quality of patient care, and a continued increase in health care expenditures.

We cannot expect this situation to continue. Significant new trends have developed. Stringent cost controls have been placed on hospital payment for Medicare cases. Price competition and discounting are widespread. The number of physicians is due to increase markedly. These trends will substantially alter the practice of medicine. The purpose of this paper is to examine the implications of these trends and to suggest ways to respond effectively to the changes that are occurring.

Trend One

The End of Cost Reimbursement

Making hospital services more available has been a desirable social goal for many years. Specifically, Congress, in establishing the Medicare Act, encouraged hospitals to provide expanded services for the elderly. The financial mechanism to create this expansion has been cost reimbursement. In practice, under cost reimbursement, third party payors have paid for almost any service ordered by a physician. The result was that hospitals could provide increased services with the assurance that the charges would be paid. Not surprisingly, what has happened is a continued rise in health care expenditures. Because of

these high expenditures, the days of cost reimbursement are coming to an end.

Stringent cost controls began with the Tax Equity and Fiscal Responsibility Act (TEFRA) of 1982, for services provided to Medicare cases. Deliberately, these controls do not directly involve the physician nor the patient. Instead, "caps" are placed on payment to hospitals. Beginning with fiscal year 1984, Medicare will pay the hospital a flat rate for each of 467 groups of diagnoses. (Diagnosis Related Groups, or DRGs). The payment will be fixed, without regard for the number of services supplied to a patient, or for the total cost of hospital care. A byproduct of this payment system is that the medical record and the hospital charges for each patient will be linked. Hospitals, for the first time, will be able to analyze the costs of care for a given diagnosis, or for a given physician.

Hospitals will manage their revenues differently, as a result of this kind of analysis. The emphasis will shift from placing prices on services to controlling the total cost of hospital care. This approach to management must lead to a fundamental change in attitude. Hospitals once were service organizations, developed to support the needs of physicians and patients. Now, each diagnostic group will become a profit (or loss) center, and will be separately analyzed. Services which lose money may be dropped. Hospitals, in order to survive financially, will become business organizations providing selected services at set costs.

Trend Two

The Rise of Price Competition

We have always had competition. Physicians have competed by being available and by providing service. Hospitals have competed by offering a variety of services and amenities. This kind of competition has

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been healthy and enhances patient care.

The new development is competition based on price. Certain factors seem to favor the development of price competition in a community (Figure). To be emphasized are the effects that organized groups may have on medical practice. Self insured employers will negotiate to cut the costs of health care benefits for their employees. Hospitals will attempt to "capture" these employees by negotiating for their services based on price. The object will be to maintain or to expand hospital use. Physicians will be offered a chance to care for these "captive" patients in exchange for discounting their fees.

- Factors Favoring Price Competition**
- Uncontrollable rises in health care costs
 - Surplus of hospital beds
 - Surplus of physicians
 - Large, self-insured businesses
 - Large, multispecialty clinics
 - Multihospital holding corporations

Figure

Price competition implies that, in the future, free choice of a physician or a hospital by a patient will be less common. In this situation, solo physicians and small group practices may find it hard to compete. Large groups generally are more able to provide specific services at a specified price. Price competition is a potent trend favoring mergers and coalitions of physician groups.

Trend Three

Increasing Financial Stress for Hospitals

Hospitals generally are experiencing fewer patient days. Part of this change is an effect of 1981-82 recession. Some of this change may be a response to the increasing cost of hospital care. However, new developments suggest that a declining hospital census may be a permanent trend. More patients are being treated in ambulatory settings. Many of these patients were once routinely hospitalized for the same care. Cystoscopies, D&Cs, breast biopsies, GI investigations are examples. Another development is the rise of alternative delivery systems. HMOs and PPOs closely restrict hospital use, and aggressively seek discounts from the hospital. In addition, physicians are making more use of home nursing care and similar services, in order to reduce the length of costly hospital stays.

The impact of these changes is that the patients who are hospitalized will be sicker, and will require more services, and will incur greater costs. Hospital revenues to meet these costs will be limited by cost

controls, price discounting and fewer admissions. Many hospitals will be under severe financial stress as a result.

Faced with this stress, hospitals can respond by cutting costs or by expanding revenues. Each has important implications for physicians. Cutting costs may mean the hospital will join a multihospital organization to reduce purchasing costs and to benefit from shared administrative services. Cutting costs may also mean reducing or eliminating unprofitable, but possibly essential, services to patients. Raising revenues may mean developing other business ventures to support the basic operation of the hospital. Raising revenues may also mean developing services that are competitive with physicians, such as "urgicenters" or laboratory service for physician's offices. The financial stress felt by hospitals may place the hospital administrator and the medical staff in financial conflict.

The Changing Role of the Organized Medical Staff

Financial stresses will lead to extraordinary changes in the relationship between physicians and hospitals. The most extreme change will be related to the new prospective payment system for Medicare cases. Prospective payment reverses the revenue expectations for the hospital. Everything that a physician orders for a patient now will become a cost to be subtracted from the fixed payment to be received by the hospital. Under cost reimbursement, physicians who were high volume users of laboratory and radiology services were financially helpful to the hospital. With a fixed payment for each case, such practices by physicians may cause the hospital to lose money. As a result, each physician's practice will be closely scrutinized by hospital administrators. The situation at each hospital will be different, depending upon the cost structure of the hospital, and the case mix of Medicare patients.

The key point for all hospitals is that prospective payment for patient care has caused a fundamental shift in the control of the use of hospital resources. In the past, physicians, by writing orders, controlled resource use and therefore the cost of care. Now hospitals will develop their own controls on the use of resources in order to remain financially solvent. However, these controls may bring physicians and hospital administrators into conflict. Decisions must be made concerning the kinds of care the hospital can afford to provide. In order to make such decisions, changes will be needed in the organized medical staff.

Traditionally, the organized medical staff of a hos-

pital has limited purposes. Aside from representing the views of the medical staff, little authority exists to act in hospital affairs. Generally, medical staff organizations are loose federations of colleagues. Decisions traditionally are reached by consensus, in which everyone who has an opinion can participate. Such decisions often express the diversity of human purpose. That is to say, it is hard to define what happened. In addition, some medical staffs have powerful cliques with opposing views. In this setting of divisive interests, a few individuals, even the hospital administrator, can control the entire staff. These fragmented and ineffectual kinds of organizations must change. Now, decisions are needed that will have serious impact on hospitals, on physicians, and on the quality of patient care. These decisions must produce reliable, predictable results in controlling costs. In order to be effective, organized medical staffs will need to develop managerial skills.

One skill that will be needed is the ability to ensure cost effective practices. For example, a given hospital may consider terminating certain services, because they are money losers. The medical staff may want to continue such services by agreeing to control costs. Under these circumstances, the medical staff organization will be faced with achieving commitments from physicians for cost effective behavior. Evidence exists that such commitments can be obtained, and costs can be controlled, if properly approached.^{1,2}

Another skill that will be needed is to develop a single point of view in matters concerning patient care. The organized medical staff must be able to negotiate with hospital administrators concerning what is appropriate patient care for their hospital. Negotiation requires a clear sense of purpose, and a unified medical staff willing to speak with one voice. "Divide and conquer" is still a fundamental technique used by the powerful to control the weak.³ Negotiation does not necessarily imply conflict and manipulation. The successful medical staff will be able to negotiate with hospital administrators to develop unified goals for patient care in their hospital.

The medical staff will not be able to manage intelligently, or to negotiate with confidence, unless it has reliable information about practice patterns and costs

in their hospital. The medical staff and hospital administrators will need to work together to interpret such information, since it may be very complex financial data. Outside data sources may be needed in order to make comparisons. The point is not to manage the hospital, but to help the medical staff to manage. It will be very difficult to persuade physicians to change their practice habits, in order to save money, unless they are convinced that such a change will benefit patient care in some way.

Discussion

We need to prepare for the future, or we will be controlled by it. We cannot predict what will happen, of course. What we can do is to project current trends, and to design ways to respond effectively. It is clear that we must prepare for a more competitive, cost controlled, environment. Given this environment, a well organized hospital medical staff will become a necessity. Such a medical staff organization will need to negotiate for the services of its members, based on the commitments that it can obtain from those members. Because of the voluntary nature of the medical staff, some kind of incentives will be necessary to make these commitments effective.

One approach has been suggested by Paul Ellwood, the MeSH concept.⁴ This involves a joint physician-hospital organization, with a corporate structure. Alternative approaches may be developed to appeal to the basic good will that physicians have toward hospitals. Whatever incentives are chosen, the successful hospital will have a medical staff and administration that can find ways to work together to meet the needs of patients within the financial resources that are available to their hospital.

Now is the time to take action. The competitive forces which have been described are rapidly gathering strength. The effects of prospective payment will be increasingly apparent over the next several years. Hospitals which are heavily dependent upon Medicare revenues will be particularly vulnerable. By 1987, when prospective payment is entirely phased in, the economic stresses will be intense. Hospital medical staffs must recognize the urgent need to organize themselves to address these issues.

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Blue Cross/Blue Shield Physician AWARE Program

FRANK E. JOHNSON, M.D.

Medical Trustee for Blue Cross and Blue Shield of Minnesota

BLUE CROSS-BLUE SHIELD (BCBS) provides health insurance coverage for over 800,000 persons throughout Minnesota. It has a viable and growing HMO arm but is fundamentally committed to preservation of fee-for-service medical care. Its operation has been modernized and streamlined to make it lean, efficient, and adaptable to the needs of a rapidly changing environment. Great strides have been made toward personalizing service and reducing paper work for both the subscriber and provider. The time from receipt of a claim to payment is approaching an irreducible minimum. These measures for economy which were under the control of the company have been taken, and yet because of price, patients continue to desert traditional fee-for-service care for one or another of the prepaid plans. By this means, therefore, patients have clearly demanded that the third party payor become actively involved in trying to slow the rise of medical care costs.

In responding to this subscriber demand the administration and Board of Trustees of BCBS have accepted the responsibility to help subscribers understand that the increasingly sophisticated and complex modern health care system will necessarily cost more. At the same time, Blue Cross Blue Shield agrees to ensure for them that premium dollars are spent in a prudent, cost-effective manner. It was felt that if such an objective could be realized, fee-for-service with all its perceived benefits might take on new life.

The result of accepting this responsibility is the AWARE program. The hospital AWARE portion has been in place since April, 1983. Twenty hospitals in the Minneapolis-St. Paul metropolitan area are AWARE member hospitals. These hospitals have negotiated contracts with BCBS which mark them as being cognizant of the goals of the AWARE Program.

The physician AWARE component was brought into place on 1 October, 1983. As of this writing, over 5,000 physicians have subscribed to the philosophic objective of making fee-for-service medical care competitive in the marketplace. In order to accomplish this, they have agreed to certain measures of self discipline. The initial thrust will affect primarily the metro physicians, as I will describe.

The metropolitan AWARE physicians have agreed to hospitalize, when possible, at one of the 20 AWARE hospitals in the Twin Cities. Pre-admission certification will be required for all except emergency and obstetrical hospital admissions. Peer review for appropriateness of hospital admissions, quality of care, and length of stay have been entrusted to the Foundation for Health Care Evaluation. This will resemble the monitoring system for which 42 major corporations representing 120 companies now contract with the Foundation in its Private Review Program. BCBS is to be congratulated for the wisdom of this decision by which it divests itself of the possibility of bias in matters of quality of care.

Physicians outside the metro area, for the present, will not participate in the Foundation's program of preadmission certification and Peer Review. They are asked to call a toll free number (1-800-642-8904) for authorization if they wish to hospitalize for treatment one of the 25 conditions which have been determined could be cared for in an ambulatory setting. In addition, they are encouraged to refer to AWARE physicians, whenever this is practical. In those instances where the patient is referred to an AWARE physician in the metro area, the patient may expect to be hospitalized at an AWARE hospital.

Doctors will be pleased to know that in developing the physician AWARE component, BCBS received input from a physician advisory committee made up of 15 recognized leaders representing several medical disciplines from out state as well as from the metropolitan area.

This ad hoc committee and BCBS representatives met regularly over a six-month period to advise BCBS in developing a competitive plan retaining the traditional fee-for-service delivery system. The demonstrated benefit of this exchange of ideas between physicians and BCBS will result in replacement of the ad hoc physician advisory committee by a permanent advisory committee elected from the BCBS corporate membership.

It is my personal opinion that BCBS with physician help has created a mechanism which is more than a survival technique or holding action but is a measure

upon which fee-for-service medicine could build a model for medical care which preserves traditional elements of freedom for both physicians and patients and yet is vigorously competitive.

Physicians want to practice excellent care in an economical way. BCBS has the ability to collect data, to help us approach that goal. I am hopeful, therefore, that an increasingly close-working relationship will develop between AWARE physicians and BCBS. The way to this close-working relationship will not always be smooth but with each party showing desire and good faith in looking toward a common goal, progress will be made. We have here created for the first time the possibility of a win, win, win situation.

If the AWARE program lives up to its potential, as I envision it, hospital and physician providers will win; BCBS will win; and subscriber patients will win.

I encourage physicians not only to become AWARE physicians but to enter into the spirit of the effort to make our practice as clean, lean and economical as possible. I urge that their thoughts about improving the system be communicated to the permanent advisory committee to BCBS which is soon to be formed. I am convinced that this program has the possibility of maintaining those elements of traditional medical care practice which all agree are desirable. An important side benefit for society could be a strengthening of organized medicine.



MMA Outreach Program, September 8 in Brainerd — (left to right) Ronald M. Sorenson, M.D., president, Upper Mississippi Medical Society; Thomas G. Briggs, M.D., MMA president-elect; Gerald E. Larson, M.D., trustee, and Arden Anderson, M.D., secretary, Upper Mississippi Medical Society (Photo by Roger Johnson).

HMOs and Cost Containment

KATHERINE HIDUCHENKO, M.D.*

HMOs are widely acclaimed as a cost effective method of health care delivery. For over a decade this federally sponsored health care system has been heavily subsidized, promoted, and advertised. Its claimed achievements are examined here in the light of actual evidence. The available data do not necessarily support the HMOs' claims. A possible alternative approach to cost containment effort is briefly considered.

MORE THAN a decade has passed since President Nixon, in 1971, unveiled his new health policy which called for a creation of a network of HMOs to slow down the rate of increase in health care costs.^{1,2} Two years later, upon President Nixon's recommendation, the Congress passed the HMO Act of 1973. Thus the weight of government's will and resources was thrown behind the idea of HMO.

The Push for HMOs

Although the term "HMO" came into being with the government's heightened involvement in health care planning during the early 70s, the term now is applied to any organization that provides comprehensive health care services for a specified group of persons at a fixed periodic payment. From the early 70s on, the Federal Government aggressively pushed the HMO concept as a "cost effective" alternative to a fee-for-service mode of practice by providing HMOs with grants, loans, loan guarantees, technical assistance, and, finally, an assured access to the market by compelling the employers of 25 or more persons to offer their employees an option to enroll in a qualified HMO as an alternative to other health insurance systems. As a result, the number of operating HMOs has grown from about 33 prepaid group plans in 1971 to a total of 265 HMOs by June 30, 1982, with a combined total enrollment of 10.8 million members.³ Most HMO enrollees come from a healthy employed population. By mid-1982, seventy out of 265 HMO plans reported some Medicare and Medicaid enrollees, with about 4% Medicare and 2% Medicaid of the total HMO enrollment.³ The latest available HMO census figures show that enrollment is still on the rise, although the rate of increase has slowed down to 5.5% for 1982 from the more rapid growth of 12.8% for the 1980/81 period.³

1981/82 HMO Slowdown

Interstudy attributes the '81/82 slow-down in HMO enrollment to a nation-wide decrease in the employment caused by a recession.³ Another factor that may possibly be responsible for a slow-down in HMO enrollment would be a declining employee interest in the HMO services. Whatever the case may be, one thing is a certainty: the '81/82 slow-down in HMO enrollment has not been caused by any lack of determination on the HMOs' part to corner the market.

HMO Advertising

Although no precise figures are available on the advertizing activities of HMOs, they appear to be steady, large-scale, and productive, in terms of attracting new members, as the following examples demonstrate: When in May 1980 the Kaiser Foundation launched an advertising campaign to attract Medicare beneficiaries, by January 1981 six thousand new Medicare members were enrolled, 2000 in excess of the goal.¹ In summer 1979 the Health Insurance Plan of Greater New York, faced with the Blue Cross competition for state employees, countered with a massive campaign at a cost of over \$117,000 and netted 14,000 telephone inquiries on the hot line number, and 1000 mail requests from civil service employees.⁴ Competing Twin Cities HMOs also are reported as very active advertisers.⁵ The American Medical News reports that MedCenter's ads appear on up to 39 billboards at any one time, and every couple of weeks it runs an ad in the Sunday editions of two local newspapers, in addition to the periodic ads on the radio.⁵ Share, another Twin Cities HMO, was expected to spend over \$100,000 in 1982 to attract Medicare beneficiaries to its demonstration program.⁵ An executive of Twin Cities' Group Health Plan is reported to have said: "We can't do much for less than a quarter of a million dollars" in the Twin

*Endocrinologist and internist, Minneapolis.

Cities competitive HMO market.⁵

The "Cost Effectiveness" of HMOs

Medical and non-medical literature is replete with articles on HMOs, mostly bearing the good news that HMOs are "cost effective" alternatives to the conventional, fee-for-service, mode of practice. The often repeated claims that HMOs are "cost effective" has become to many an unquestioned fact; an article of faith, if you will. But what is the factual evidence that supports HMOs' ability to deliver medical care at a saving?

Harold S. Luft, Ph.D., has written extensively on HMOs for over a decade, and is often quoted by others. In an article, titled, "How Do HMOs Achieve Their 'Savings'?", published in 1978, Luft admits to having summarized "virtually all the evidence of the last 25 years concerning HMO 'savings'".⁶ The time period he refers to is from 1951 to 1975.⁶ One measure of "savings" in his article is calculated in terms of the "total medical care expenditures", which are defined as the sum of health care premiums plus estimated out-of-pocket costs.⁶ In each of the five comparison studies done, between 1958 and 1971, at least one California Kaiser-Permanente Plan was included in the study as a standard for comparison.⁶ The compared data, between the California Kaiser-Permanente Plan and other health insurance plans, revealed incontrovertible evidence that the "total costs", as defined by Luft, were 10 to 40 per cent lower for California Kaiser-Permanente as compared to conventional coverage.⁶ This holds true for Kaiser-Permanente, for the years 1958 to 1971. It is doubtful, however, that any valid generalization can be made from the California Kaiser-Permanente experience, of 1958 to 1971, to the present day real world of HMOs experience, with all their favored provider status bestowed upon them by the Act of Congress in 1973.

HMOs versus Private Plans

In the same article, Luft also reviews hospital utilization experiences of the "HMO" and private group enrollees for the time period of 1951 to 1975.⁶ Of the 51 pairs of "HMO" and private group hospitalized enrollees compared, about 80% of "HMO" enrollees had a lower hospital utilization rate than their private group counterparts, while 20% of private group enrollees had an equal or lower number of hospital days per 1000 enrollees.⁶ Recent statistical data for the Minnesota HMOs shows that tight HMO utilization review policies resulted in a progressive decline of hospital days per 1000 enrollees at an average of 3%

per year.⁷ The Physicians Health Plan of Minnesota boasts a decrease in hospital days from 750 per 1000 enrollees in 1977 to an estimated 445 days per 1000 enrollees for 1982.⁸ The 1981/82 InterStudy data on nationwide HMO hospital utilization rates indicates that the average number of hospital days was 480 per 1000 enrollees.³ It is an impressive economic achievement, to be sure. However, similar strides have been made by non-HMO insurers and providers to reduce the hospital utilization rate. Their efforts have been guided primarily by the fact that hospital care costs comprise the largest share of the health dollar, amounting to \$99.6 billion in 1980 and constituting 46% of the total personal health care costs, as compared to 39% in 1965. When the Minnesota Foundation for Health Care Evaluation (FHCE) had contracted with 16 Twin Cities' major employers for a private hospital utilization review, hospital utilization had dropped, in one year, from 850 days per 1000 enrollees to 505 per 1000 enrollees employed in those industries.⁹ To its credit, the FHCE recognizes that other elements, in addition to the utilization review, have contributed to this success. A slight decline in hospital utilization on a community-wide basis has been reported by Gary Appel, president of the Twin Cities Council of Community Hospitals.⁷

To compare hospital utilization between HMO and non-HMO enrollees, the enrollee groups need to be appropriately matched, in particular with regard to age, because of the high positive correlation between the increased age and the increase in hospital utilization.¹⁰ Another important factor to be considered is the element of enrollees selection. In a recent article, Luft admitted that he had no idea whether "5, 50, or 90 percent of the observed difference in hospitalization" was due to selection of HMO enrollees.¹¹ It is prudent, therefore, to accept HMO data with a healthy dose of skepticism until it is checked out.

Assuming, for the time being, that HMOs have succeeded in decreasing hospital utilization rates to some extent, how do their total medical costs per enrollee compare to those of the private insurance sector? Does HMOs claim of cost cutting by way of reducing the hospital utilization rate translate into a lower total cost per enrollee per year? Precise data is hard to come by. Some HMO statistics are published annually by the U.S. Department of Health and Human Services¹²; InterStudy publishes annual statistics on HMOs by states and nation-wide³; Minnesota Department of Health publishes statistics on state's HMOs¹³; Health Insurance Association of America annually publishes the Source Book of Health Insur-

ance Data, which provides pooled statistical data on the private insurance industry in the United States.¹⁴ A careful review of the data provided by the sources listed above, some updates obtained by way of personal communications with representatives of the Health Insurance Association for the year 1981¹⁵, and Blue Cross and Blue Shield of Minnesota also for the same year¹⁶, affords an opportunity to make a comparison with respect to total annual costs per enrollee for Minnesota HMOs versus the private health insurance industry nation-wide. Pertinent figures are presented in the Table.

insurance sector data would fall into an approximately equal mean value with the Blue Cross/Blue Shield of Minnesota, once private insurance sector's data is winnowed of the "dental expense" and the "loss of income" benefit payments.

Rising HMO Costs

It would appear that the data in the Table does not support the HMOs' claim that HMOs are saving money, at least not in the Twin Cities, which is considered a hotbed for HMO concept. Looking at it yet

TABLE

Total Medical Costs Per Year Per Enrollee by
Type of Insurer in the United States for 1981*

Insurer	Number of enrollees	Total pay out per year by insurer	Total pay out per enrollee per year	Reference
Private† insurance	188,340,000	075,888,000,000	402.90	14,15
BC/BS of Minnesota	856,351	288,483,353	336.90	16
HMO	062,872	027,643,560	439.70	13
Minnesota PHP	097,073	042,599,515	438.90	13
Minnesota All 10 HMOs‡	520,580	211,834,413	406.90	13
Minnesota				

*For the purpose of this article, "total medical costs" is defined as the total amount of money spent by the insurer per enrollee per year. The latest year for which data was available was 1981.

†The private health insurance industry data consists of benefit payments made for all covered enrollees for 1981. The data includes all medical costs, dental costs, and loss of income due to accidents or illnesses. Nation-wide HMO data is included in the private insurance figures.

‡Minnesota's 10 HMOs "total pay out per year by insurer" figure was derived by multiplying the total number of enrollees by the weighted average of inpatient and outpatient costs per enrollee per month, multiplied by 12. The administrative costs per enrollee per month were excluded from the "total pay out" figures.

NOTE: Share Health Plan, one of the 10 Minnesota HMOs, has a substantial Medicare demonstration program. Share's Medicare enrollees comprised about 13% of the total enrollment in 1981, but the Medicare data are excluded from above table.

Problems of Comparing HMOs to Private Group

Before any attempt is made at drawing a conclusion from the data listed in the Table, it would be prudent, perhaps, to enumerate the things the data purports to represent and the things it does not represent. It represents, at first glance, statistical means obtained from three seemingly different sets of data. The data on HMOs, as received, was neatly separated into three distinct components of "inpatient costs, outpatient costs, administrative costs" for the 10 Minnesota HMOs, separately and jointly, whereas no such breakdown of figures was available for the Blue Cross/Blue Shield of Minnesota and the rest of the private insurance sector. Furthermore, the private insurance sector's "medical expense" data is listed with the "dental expense" and the "loss of income" benefit payments. But if the Blue Cross/Blue Shield of Minnesota experience is to serve as any guide, it is not unreasonable to assume that the rest of the private

another way, it should be noted that the HMO average family premium rose by 14.3% over the preceding year in 1982.³ In comparison, the total medical component of the consumer price index rose only 12% for the same period.³ No figures are available for the out-of-plan expenses incurred by HMO enrollees for the medical care received from non-participating physicians.

HMO Responses to Rising Costs

It is generally agreed that the HMOs make an aggressive effort to control the rising costs of medical care. Their efforts to reduce hospital utilization have been discussed earlier. A pressure is also applied on pharmacists to lower the price on prescription drugs.¹⁷ Some Twin Cities pharmacists maintain that they actually lose money on some of the PHP prescriptions.¹⁷ At some point, the HMOs' efforts at cost cutting end, and economic self-interest begins. One of the HMOs' efforts at cost containment that would,

primarily or exclusively, benefit a particular HMO, would be in the category of patient selection; for instance, discarding high-risk enrollees. Luft cites an example of one Twin Cities HMO dropping a contract with a local employer because of high maternity care incidence.¹⁸ PHP of Minnesota makes a point of informing its member physicians that "we will continue to cancel some accounts in the future, because of the many variables that can turn an account into a financial drain. . . ."¹⁸ Increasing pressure is applied by HMOs on their member physicians "to find ways to contain their costs," which in effect places a demand on them to give as little medical and hospital care as possible. Most (if not all) HMOs have some type of risk-sharing arrangements with their participating physicians. In general, all risk-sharing arrangements have this element in common: an economic incentive to spend as little money as possible on patients' care in order to save as much money as possible for the plan. The plan's physical survival becomes an all absorbing consideration. "Without these efforts," declares one of the Twin Cities HMOs, "(the plan) would long ago have met the fate its competitors wish for us."¹⁸

HMO Payment Schemes for Physicians

In an HMO group-type of practice, generally, two payment schemes are employed to encourage the member physicians to cut down on costs to the plan:¹⁸ (a) salary with some type of bonus payment to reward the physicians if the group performed well, (b) fee-for-service payment modified by an incentive payment from the residual funds in the pool, if any. In the case of the individual practice association type of HMO, in which HMO contracts with independent physicians for services, the physician agrees to accept the HMO allowed payment as payment in full in addition to a withholding of a stipulated percentage of physician's fee to be placed at risk. The reserve balance of physician's fee is paid partially or in full, but only if the HMO plan performs according to the management's economic expectations. One of Twin Cities HMOs recently introduced yet another "cost containment element" into the physician's cost cutting scheme by rewarding a physician with 100% of his/her withheld reserve if the physician's average cost per patient per year fell below the mean for his/her specialty, and denied partly or in full the reserve withheld of a physician whose cost per patient per year fell above the mean.⁸

"Cost Management" and Quality Care

The apparent problem with the "cost management

element" is that it obviously discriminates against a physician who happens to attract a more difficult patient. It also raises an ethical question of whether a patient should be subjected to a less than optimal attention because of the physician's fear to overstep some artificial and unknown mean. Concerns have been expressed in the literature about the overall effect of the HMOs' negative incentives upon the quality of medical care. Bruce Wolff, one of the assistants to the former secretary of HEW, Joseph Califano, has been quoted saying that the government is "painfully aware" of the "suspicions" among employers, congressmen, and consumers that the HMOs' potential for withholding services may have a negative effect upon the quality of care.¹⁹

It should be remembered that the idea of cost containment was the primary consideration in fostering the HMO concept in the early 1970s. The medical profession has gracefully accepted both its challenges and its burdens. Yet more than ten years later, the problem of rising medical costs is as acute, in 1983, as it was back in 1971. New initiatives that come to the public scene, of late, usually involve some form of competitive strategy; the latest to appear on the horizon include the preferred provider organizations, and the "new medical-industrial complex" that supplies health care services for profit.²¹

Role of Physicians in Containing Costs

Amidst the competing factions in the medical market, the physician cannot remain a placid observer or a mere tool of this or that faction. The physician, by virtue of the special knowledge he or she possesses, is the only person that is in the position to provide the public and its elected representatives with the indispensable information needed to form a rational base from which to begin the task of trimming the medical expenditures. The recent Health Care Financing Administration Review provides a breakdown of data that is responsible for the relative contribution to the growth of medical costs from 1965 to 1981. The medical costs growth figures amount to 59% due to price inflation, 9% due to increase in population, and 32% to "other factors."²⁰

Since the first two factors are largely outside of physicians' control, with the exception, perhaps, of the simplistic approach of cutting down on doctors' income, without a corresponding attention given to the rising office overhead expenses, an attempt should be made to fully analyze the remaining 32%. A precise assessment should be made of the relative contributions that numerous factors make on the increase in medical care costs, for example, expanding

technology, an increase in number of the aged population, a proliferation of non-physician health care practitioners, a spread of limited purpose facilities such as PMS clinics, and many others.

It is within the province of the medical profession to pass judgment on the relative value of each of these and other components with respect to their utility, and to present these data to the public. The public, then, would be in a position to reach an informed consensus with regard to which of these services, and to what extent, it will be willing to pay for these. It also should be considered as physicians' duties to formulate a list of priorities in medicine. Every therapeutic procedure has its relative value in relation to the pres-

ervation of life, function, or comfort. By way of example, an emergency appendectomy would be dubbed a first priority type of procedure, while a cosmetic breast reduction operation would be placed somewhere towards the end of the scale on the list of priorities. Our society needs to be sufficiently informed about these matters in order to decide which of these services should be guaranteed for all, regardless of the cost, and which should be deemed optional and subject to the consumers' personal responsibilities. A value and priority oriented approach to cost cutting is likely to achieve what an "empirical" approach to cost cutting could not.

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Medicaid Cost Containment in Minnesota

Long Term Care Reimbursement

ROBERT J. BUCHANAN, Ph.D.*

Since long term care expenditures absorbed 65.6% of the \$795.5 million Medicaid budget in Minnesota during 1982, cost savings on nursing home reimbursement would have a significant impact on the containment of total Medicaid outlays. This study compared various reimbursement practices used by Minnesota Medicaid program with the results of a national study of state Medicaid programs. One important discovery, with cost containment implications, is that Medicaid recipients in Minnesota utilize higher priced skilled care at much greater rates than the averages for Medicaid recipients in either the Great Plains region or the nation. Had the skilled/intermediate care patient day mix in Minnesota approached the average for the nation, then Medicaid expenditures would have been reduced by \$27.8 million during 1981.

THE RESEARCH INSTITUTE of Pharmaceutical Sciences (RIPS) at the University of Mississippi conducted a national study of state Medicaid programs to determine the impact various reimbursement factors have had on the cost and utilization of long term care between 1975 and 1981. A series of survey questionnaires were mailed to all state programs to gather data on per diem payments and the reimbursement factors used for both skilled and intermediate care. State utilization data for Medicaid recipients 65 years and over were obtained from the Health Care Financing Administration of the Department of Health and Human Services for both types of care.¹ This study compares the Minnesota Medicaid program to the findings for the nation. Given the fact that long-term care expenditures absorbed 65.6% of the \$795.5 million Medicaid budget during 1982 in Minnesota, cost savings on nursing home reimbursement would have a significant impact on efforts to contain total Medicaid spending. Nationwide, long term care expenditures by state Medicaid programs averaged only 43.4% of their Medicaid budgets during 1982.

Reimbursement Factors

The RIPS national analysis of reimbursement factors used by state Medicaid programs to pay for long term care discovered that some of these mechanisms are associated with lower per diem payments. A discussion of these factors follows.

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Return on Net Equity

Federal regulations allow each state Medicaid program the option to treat "a return on proprietary provider's net equity" as an allowable cost when calculating payment rates. Of the states responding to the survey, return on net equity (RONE) was used as an allowable cost for skilled care by 28 states and not allowed by 14 states during 1980. During 1980 the average RONE rate used by the 28 state programs was 14.07%. The Medicaid program in Minnesota allows the reimbursement of an investment allowance to proprietary providers. This investment allowance gives proprietary providers 11.1% of the original cost of the building and fixed equipment as a reimbursable cost. Typically a state program reimbursing a profit factor does it in the form of a return on net equity. On average states allowing RONE reimbursed profit seeking facilities 14.07% of the net equity (assets less debt) the owners had accumulated in the long term care facility. The Minnesota program reimbursed proprietary facilities 11.1% of the original cost of the facility, a more lucrative reward to providers.

The national analysis of Medicaid programs revealed that states allowing RONE as a reimbursable cost paid significantly higher per diem rates for skilled care than states which did not. These observed outcomes were also true for intermediate care rates although the differences were not as large as for skilled care. Medicaid recipients in states allowing the use of RONE had somewhat greater access to skilled care but lower access to intermediate care than Medi-

caid recipients in states not allowing RONE. The Medicaid program in Minnesota could eliminate this investment allowance to contain expenditures without reducing the access Medicaid recipients have to care, according to the RIPS national study.

Capital Interest Expenses

The survey of Medicaid programs conducted for the national study asked each state how interest expenses incurred by long term care facilities for capital indebtedness were treated for reimbursement purposes. Each state program was given the following choices: not an allowable cost; full reimbursement of interest expenses; and, reimbursement of interest up to a ceiling. During 1981, of the states responding to the survey, 21 states reimbursed interest expenses up to a ceiling, 16 states permitted full reimbursement, and no states treated interest expenses as not an allowable cost. According to the survey, the Medicaid program in Minnesota allows the full reimbursement of interest expenses for capital indebtedness incurred by non-profit providers and limits the reimbursement of interest expenses to proprietary providers. The results of the national study indicate that states placing a ceiling on capital interest expenses averaged lower payments for skilled care and to a lesser extent intermediate care. States placing a ceiling on capital interest expenses had higher utilization of skilled care but lower utilization of intermediate care than states allowing full reimbursement.

Inflation Factor

The survey of state Medicaid programs for the national study asked each state what percentage rate was used annually as an inflation factor when calculating long term care reimbursement fees. The results of the national study indicate that higher inflation factors used in determining payments were associated with higher reimbursement rates. The analysis also revealed that higher inflation factors were not linked to greater access to care. The average inflation factor used by the state programs responding to the survey was 11.97% in 1981, greater than the 10% level used as a ceiling in Minnesota. Prior to 1981, the Minnesota Medicaid program allowed providers to project known cost increases and this resulted in much higher rates, for example, 16% inflation factor for skilled care in 1981. The ceiling of 10% adopted during 1981 should help contain spiraling long term care costs in Minnesota.

Percentiles

State Medicaid programs can use a percentile methodology when calculating new per diem rates for

long term care. The first step in the percentile methodology is to classify providers according to the type of care delivered. Next, the providers are rank ordered within each classification according to each provider's projected costs for delivering that type of care. This results in an ascending array of projected per diem costs. Finally, the provider at the Xth percentile level of this ascending array is selected and the projected per diem cost incurred by that provider serves as the Medicaid reimbursement rate for all facilities delivering that type of care. The percentile levels used by the state programs during 1981 to calculate new nursing home rates ranged from the 50th percentile to the 90th percentile, with an average of the 69th percentile. The Minnesota Medicaid program used a variation of the percentile methodology, setting new rates at "125% of the average rate for the region in each level of care."

One of the major findings of the RIPS national study was that between 1975 and 1981 states using the percentile methodology in reimbursement paid dramatically lower per diem fees for long term care (e.g., 1981 — \$36.18 for skilled care and \$29.96 for intermediate care) than states not using the percentile methodology (e.g., 1981 — \$42.43 for skilled care and \$33.18 for intermediate). Medicaid recipients experienced greater access to care in states using the percentile methodology, indicating that this cost containment device does not adversely affect the access Medicaid patients have to nursing home care.

Prospective Rate Setting

Another important reimbursement factor concerns the timing for establishing payment rates. With prospective rate setting the amount of the Medicaid payment is established prior to the period the fee will be in effect. With retrospective rate setting the amount of Medicaid reimbursement is calculated after the care has been delivered based on incurred costs. Advocates of prospective reimbursement claim that it is an effective cost containment device, giving incentives to providers to deliver care efficiently. Advocates of the retrospective mechanism assert that this method is necessary to provide Medicaid patients with access to care and also to good quality care.

The analyses for the national study discovered that between 1975 and 1981 state Medicaid programs using prospective rate setting paid consistently lower per diem rates for both skilled care (e.g., 1981, \$38.11) and intermediate care (e.g., 1981, \$31.04) than states using the retrospective mechanism (e.g., 1981, \$43.30 for skilled care and \$35.00 for intermediate care). Contrary to the criticisms of the pros-

pective method relating to access, Medicaid recipients in states using the prospective method actually had greater utilization levels for both skilled and intermediate care than states using retrospective reimbursement.

To protect Medicaid patients from the possibility that the use of prospective rate setting could lower the quality of care, the payment mechanism should be linked to a quality of care mechanism.² The Medicaid program in Michigan takes an interesting approach to quality protection. The Department of Social Services (Medicaid) in Michigan can subject all providers to a quality of care penalty factor. The penalty is assessed against a provider's reimbursement rate, up to a maximum \$1.00 per patient day, for failure to comply with certification standards.³ The Medicaid program in Minnesota uses prospective rate setting. In the effort to contain the relatively high payment rates for long term care (Table 1), the Medicaid program in Minnesota should consider adopting a quality of care protection mechanism similar to the system used in Michigan in any cost cutting program.

Recommendations

Based on the RIPS national study of state Medicaid programs, Minnesota could change its reimbursement system for long term care to contain payments for nursing home care. Minnesota should consider eliminating its investment allowance in efforts to lower Medicaid payment rates. The state has already placed a cap on the rate of the inflation factor allowed. Importantly, the state should consider lowering its

percentage factor from "125% of the average rate for the region in each class of care" when setting new rates. The Texas Medicaid program, for example, set new rates at the mean plus 6% before it switched to the 60th percentile in 1979. Given the higher reimbursement rates for long term care in Minnesota compared to the Great Plains region and the nation, 125% appears too generous.

Cost Analysis

The Medicaid program in Minnesota paid higher per diem rates for both skilled care and intermediate care than the average rates for Medicaid programs in the Great Plains region or for the entire nation (Table 2). The national Medicaid reimbursement study discovered that health wage rates and the cost of living are strongly correlated with payments for long term care; higher wealth wages and living costs are strongly linked to higher Medicaid payments. A health wage index was developed for the national study and during 1981, for example, health wages in

TABLE 2.

Total Medicaid Patient Days
(per 1,000 elderly)

Year	Minnesota	Great Plains Region	Nation
1979	17,470	13,444 (130%)	9,929 (176%)
1978	16,719	12,701 (132%)	9,605 (174%)
1977	19,608	13,054 (150%)	9,463 (207%)
1976	17,265	12,864 (134%)	9,409 (183%)
1975	13,627	11,673 (117%)	9,076 (150%)

Note: The percentages in parenthesis following total patient days for the region and the nation are a comparison of these outcomes for total patient days to Minnesota.

TABLE 1.

Medicaid Per Diem Cost
Skilled Care

Geographic Area	1981	1980	1979	1978	1977	1976	1975
Minnesota	\$45.25	\$38.41	\$32.21	\$29.23	\$25.83	\$23.02	\$21.17
(N)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Great Plains Region	34.74	37.41	26.17	23.77	23.63	20.02	16.46
(N)	(3)	(5)	(4)	(4)	(4)	(4)	(2)
Minnesota as % of Regional Average	130%	103%	123%	123%	109%	115%	129%
Nation	39.48	35.93	31.99	28.24	25.72	23.51	22.25
(N)	(41)	(43)	(41)	(39)	(35)	(34)	(30)
Minnesota as % of National Average	115%	107%	101%	104%	100%	97.9%	95.1%
Intermediate Care							
Geographic Area	1981	1980	1979	1978	1977	1976	1975
Minnesota	\$36.63	\$31.32	\$26.24	\$23.81	\$20.77	\$18.63	\$17.58
(N)	(1)	(1)	(1)	(1)	(1)	(1)	(1)
Great Plains Region	27.66	24.33	21.20	18.78	16.78	14.97	14.68
(N)	(4)	(5)	(5)	(4)	(4)	(4)	(3)
Minnesota as % of Regional Average	132%	129%	124%	127%	124%	124%	120%
Nation	31.98	28.04	25.41	22.96	20.08	18.21	17.81
(N)	(43)	(43)	(42)	(40)	(39)	(38)	(30)
Minnesota as % of National Average	115%	112%	103%	104%	103%	102%	98.7%

MEDICAID COST CONTAINMENT — BUCHANAN

Minnesota were 6.7% higher than the national average and 20.1% higher than the regional average. These higher health labor costs in Minnesota explain much of the higher than average per diem payment rates for nursing home care. However, reform of the reimbursement system in Minnesota, as discussed earlier, could help hold down payment rates. For example, in California wage rates were 26.9% higher than the national average during 1981, but due to a stringent reimbursement methodology, the California Medicaid program was able to hold payment rates for long term care to about 93% of the national average.

Utilization Analysis

Medicaid recipients in Minnesota are utilizing long term care at much higher rates than the utilization averages for Medicaid recipients in either the Great Plains region or the nation. For example, during 1979 (the latest year utilization data are available from the federal government), total Medicaid patient days in long term care facilities in Minnesota were 130% of the average for the Great Plains region and 176% of the average for the nation. In the absence of medical need to explain this higher than average utilization of nursing home care, the Minnesota Medicaid program could save money by utilizing alternative, less costly methods of health delivery.

Breaking down long term care into skilled and intermediate care, Medicaid recipients in Minnesota

utilized skilled care at much higher rates than Medicaid patients in the Great Plains region or the nation. As Table 3 illustrates, during 1979 Minnesota had 42.0 Medicaid patients per 1,000 elderly in skilled care facilities compared to 15.8 Medicaid patients per 1,000 elderly for the region and 14.4 patients per 1,000 elderly for the nation. Utilization of intermediate care also tended to be higher in Minnesota. These observations are also similar for Medicaid patient days presented in Table 4.

These utilization observations have important total cost implications given the higher payment rate for skilled care. According to a recent RIPS survey, the Medicaid per diem payment in Minnesota was \$8.62 more for skilled care than for intermediate care during 1981. Unless there is a medical reason to explain the higher than average utilization of skilled care by Medicaid recipients, Minnesota could realize substantial savings by switching more patients to intermediate care facilities without denying patients appropriate levels of care. If the mix of skilled care/intermediate care patient days in Minnesota were to approach the average for the nation, then the savings would be substantial. For example, during 1979 (the most recent year utilization data are available for the nation from HCFA) 53.0% of total Medicaid patient days for long term care in Minnesota were in skilled care facilities compared to only 25.9% for the nation. Had that Minnesota percentage of skilled care patient days approached the national average, then the cost savings would have approximated \$13.3 million during 1979*. Based on a recent RIPS survey of the

*Assuming a skilled care utilization rate of 25.9% (national average) rather than the actual 53.0% in Minnesota would have resulted in 2,222,160 fewer skilled care patient days during 1979. At a cost differential of \$5.97 per patient day between skilled and intermediate care in Minnesota, the resulting total Medicaid cost savings would have been \$13,266,295 for 1979 and Minnesota's share of this total savings (at 44.74% state participation in Medicaid program costs) would have been \$5,935,340.

TABLE 3.
Medicaid Patients (Per 1,000 Elderly)
Skilled Care

Geographic Area	1979	1978	1977	1976	1975
Minnesota	42.0	40.2	36.9	30.5	28.4
(N)	(1)	(1)	(1)	(1)	(1)
Great Plains Region	15.8	16.3	14.7	14.7	14.4
(N)	(6)	(5)	(6)	(6)	(6)
Minnesota as % of Regional Average	266%	247%	251%	207%	197%
Nation	14.4	18.4	17.2	16.3	16.5
(N)	(40)	(41)	(43)	(40)	(40)
Minnesota as % of National Average	292%	218%	215%	187%	172%
Intermediate Care					
Geographic Area	1979	1978	1977	1976	1975
Minnesota	36.0	37.8	38.5	35.7	31.2
(N)	(1)	(1)	(1)	(1)	(1)
Great Plains Region	37.4	36.3	35.9	33.6	33.0
(N)	(6)	(5)	(6)	(6)	(6)
Minnesota as % of Regional Average	96.3%	104%	107%	106%	94.5%
Nation	30.0	27.5	26.6	25.6	23.8
(N)	(40)	(41)	(41)	(40)	(39)
Minnesota as % of National Average	120%	137%	145%	139%	131%

Minnesota program, during 1981 59.0% of the total Medicaid patient days for long term care in Minnesota were in skilled care facilities. Assuming that the 1979 skilled/intermediate care patient day mix for the nation remained the same in 1981 (this probably overstates the national utilization of skilled care in 1981 as the national trend has been towards declining skilled care use), then the Medicaid program in Minnesota could have saved \$27.8 million in 1981 by placing Medicaid recipients in intermediate care facilities at a rate approaching the national average.[†]

Summary

The Research Institute of Pharmaceutical Sciences at the University of Mississippi conducted a national study of reimbursement factors used by state Medicaid programs to pay for long term care. The study identified factors which are associated with lower payment rates but which do not adversely affect the access Medicaid recipients have to care. The most important cost savings mechanism discovered was the use of the percentile methodology in a prospective rate setting system, which the Medicaid program in Minnesota uses. However, Minnesota should consider lowering the 125% of the average rate it uses to calculate payments and also eliminating the use of the investment allowance.

[†]Assuming a skilled care utilization rate of 25.9% (national average) rather than the actual 59.0% in Minnesota would have resulted in 3,220,569 fewer skilled care patient days in 1981. At a cost differential of \$8.62 per patient day between skilled and intermediate care in Minnesota, the resulting total Medicaid cost savings would have been \$27,761,305 for 1979 and Minnesota's share of this total savings (at 44.74% state participation in Medicaid program costs) would have been \$12,420,408.

The utilization pattern of skilled and intermediate care in Minnesota is an area offering significant cost savings potential. Medicaid recipients are placed in long term care facilities at much higher rates than the averages for Medicaid recipients in the Great Plains region or the nation. Also Medicaid recipients in Minnesota are utilizing skilled care at much greater rates than Medicaid patients in the region or nation. In the absence of medical need to explain this divergence from the national average, this study recommends that the Medicaid program in Minnesota increase the placement of Medicaid patients in intermediate care facilities and phase in reductions of skilled care placements until the utilization patterns approach those for the nation. During 1979 this substitution would have resulted in a savings of approximately \$13.3 million in total Medicaid costs and a savings of \$5.9 million in state expenditures. During 1981 the recommended utilization reform would have generated an additional reduction of \$27.8 million in total Medicaid costs and a savings of \$12.4 million in state expenditures. Given the fact that long term care expenditures absorbed 65.6% of the Minnesota Medicaid budget in 1982, these suggested reimbursement and utilization reforms could help prevent payments to nursing homes from squeezing other reimbursed services out of the Medicaid budget.

These recommendations concerning Medicaid reimbursement for long term care in Minnesota are based on the results of a national study, including a comparison of Minnesota to the Great Plains region and to the nation. The cost containment strategies

TABLE 4.
Medicaid Patient Days (Per 1,000 Elderly)
Skilled Care

<u>Geographic Area</u>	<u>1979</u>	<u>1978</u>	<u>1977</u>	<u>1976</u>	<u>1975</u>
Minnesota	9,253	8,732	8,914	7,645	5,995
(N)	(1)	(1)	(1)	(1)	(1)
Great Plains Region	3,282	3,471	3,464	3,537	3,331
(N)	(6)	(5)	(6)	(6)	(6)
Minnesota as % of					
Regional Average	282%	252%	257%	216%	180%
Nation	2,573	3,190	3,137	3,116	3,315
(N)	(39)	(41)	(42)	(40)	(41)
Minnesota as % of					
National Average	360%	274%	284%	245%	181%
<u>Intermediate Care</u>					
<u>Geographic Area</u>	<u>1979</u>	<u>1978</u>	<u>1977</u>	<u>1976</u>	<u>1975</u>
Minnesota	8,217	7,987	10,694	9,620	7,632
(N)	(1)	(1)	(1)	(1)	(1)
Great Plains Region	10,162	9,230	9,590	9,327	8,342
(N)	(6)	(5)	(6)	(6)	(6)
Minnesota as % of					
Regional Average	80.9%	86.5%	112%	103%	91.5%
Nation	7,356	6,415	6,326	6,293	5,761
(N)	(39)	(38)	(41)	(40)	(40)
Minnesota as % of					
National Average	112%	125%	169%	153%	132%

MEDICAID COST CONTAINMENT — BUCHANAN

recommended in this study must be viewed within the context of the political and administrative environments. However, they warrant serious consideration

for implementation either in their present or modified form.

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Indications: Management of anxiety disorders, or short-term relief of symptoms of anxiety: Anxiety or tension associated with the stress of everyday life usually does not require treatment with an anxiolytic. Symptomatic relief of acute agitation, tremor, impending or acute delirium tremens and hallucinosis due to acute alcohol withdrawal; adjunctively in: relief of skeletal muscle spasm due to reflex spasm to local pathology; spasticity caused by upper motor neuron disorders; athetosis, stiff-man syndrome. *Oral forms* may be used adjunctively in convulsive disorders, but not as sole therapy. *Injectable form* may also be used adjunctively in: status epilepticus; severe recurrent seizures; tetanus; anxiety, tension or acute stress reactions prior to endoscopic/surgical procedures; cardioversion.

The effectiveness of diazepam in long-term use, that is, more than 4 months, has not been assessed by systematic clinical studies. The physician should periodically reassess the usefulness of the drug for the individual patient.

Contraindications: Tablets or capsules in children under 6 months of age; known hypersensitivity; acute narrow angle glaucoma; may be used in patients with open angle glaucoma who are receiving appropriate therapy.

Warnings: As with most CNS-acting drugs, caution against hazardous occupations requiring complete mental alertness (e.g., operating machinery, driving). Withdrawal symptoms similar to those with barbiturates and alcohol have been observed with abrupt discontinuation, usually limited to extended use and excessive doses. Infrequently, milder withdrawal symptoms have been reported following abrupt discontinuation of benzodiazepines after continuous use, generally at higher therapeutic levels, for at least several months. After extended therapy, gradually taper dosage. Keep addiction-prone individuals (drug addicts or alcoholics) under careful surveillance because of predisposition to habituation/dependence.

Usage in Pregnancy: Use of minor tranquilizers during first trimester should almost always be avoided because their use is rarely a matter of urgency and because of increased risk of congenital malformations, as suggested in several studies. Consider possibility of pregnancy when instituting therapy; advise patients to discuss therapy if they intend to or do become pregnant.

ORAL: Advise patients against simultaneous ingestion of alcohol and other CNS depressants.

Not of value in treatment of psychotic patients; should not be employed in lieu of appropriate treatment. When using oral forms adjunctively in convulsive disorders, possibility of increase in frequency and/or severity of grand mal seizures may require increase in dosage of standard anticonvulsant medication; abrupt withdrawal in such cases may be associated with temporary increase in frequency and/or severity of seizures.

INJECTABLE: *To reduce the possibility of venous thrombosis, phlebitis, local irritation, swelling and, rarely, vascular impairment when used IV: inject slowly, taking at least one minute for each 5 mg (1 ml) given; do not use small veins, i.e., dorsum of hand or wrist, use extreme care to avoid intra-arterial administration or extravasation. Do not mix or dilute with other solutions or drugs in syringe or infusion flask. If it is not feasible to administer Injectable Valium directly IV, it may be injected slowly through the infusion tubing as close as possible to the vein insertion.*

Administer with extreme care to elderly, very ill, those with limited pulmonary reserve because of possibility of apnea and/or cardiac arrest, concomitant use of barbiturates, alcohol or other CNS depressants increases depression with increased risk of apnea; have resuscitative facilities available. When used with narcotic analgesic eliminate or reduce narcotic dosage at least 1/3, administer in small increments. Should not be administered to patients in shock, coma, acute alcoholic intoxication with depression of vital signs.

Has precipitated tonic status epilepticus in patients treated for petit mal status or petit mal variant status. Not recommended for OB use.

Efficacy/safety not established in neonates (age 30 days or less); prolonged CNS depression observed. In children, give slowly (up to 0.25 mg/kg over 3 minutes) to avoid apnea or prolonged somnolence; can be repeated after 15 to 30 minutes. If no relief after third administration, appropriate adjunctive therapy is recommended.

Precautions: If combined with other psychotropics or anticonvulsants, carefully consider individual pharmacologic effects—particularly with known compounds which may potentiate action of diazepam, i.e., phenothiazines, narcotics, barbiturates, MAO inhibitors and antidepressants. Protective measures indicated in highly anxious patients with accompanying depression who may have suicidal tendencies. Observe usual precautions in impaired hepatic function; avoid accumulation in patients with compromised kidney function. Limit oral dosage to smallest effective amount in elderly and debilitated to preclude ataxia or over sedation (initially 2 to 2½ mg once or twice daily, increasing gradually as needed and tolerated).

The clearance of diazepam and certain other benzodiazepines can be delayed in association with Tagamet (cimetidine) administration. The clinical significance of this is unclear.

INJECTABLE: Although promptly controlled, seizures may return; readminister if necessary; not recommended for long-term maintenance therapy. Laryngospasm/increased cough reflex are possible during peroral endoscopic procedures; use topical anesthetic, have necessary countermeasures available. Hypotension or muscular weakness possible, particularly when used with narcotics, barbiturates or alcohol. Use lower doses (2 to 5 mg) for elderly/debilitated.

Adverse Reactions: Side effects most commonly reported were drowsiness, fatigue, ataxia. Infrequently encountered were confusion, constipation, depression, diplopia, dysarthria, headache, hypotension, incontinence, jaundice, changes in libido, nausea, changes in salivation, skin rash, slurred speech, tremor, urinary retention, vertigo, blurred vision. Paradoxical reactions such as acute hyperexcited states, anxiety, hallucinations, increased muscle spasticity,

insomnia, rage, sleep disturbances and stimulation have been reported, should these occur, discontinue drug.

Because of isolated reports of neutropenia and jaundice, periodic blood counts, liver function tests advisable during long-term therapy. Minor changes in EEG patterns, usually low-voltage fast activity, observed in patients during and after diazepam therapy are of no known significance.

INJECTABLE: Venous thrombosis/phlebitis at injection site, hypoactivity, syncope, bradycardia, cardiovascular collapse, nystagmus, urticaria, hiccups, neutropenia. In peroral endoscopic procedures, coughing, depressed respiration, dyspnea, hyperventilation, laryngospasm/pain in throat or chest have been reported.

Dosage: Individualize for maximum beneficial effect.

ORAL: Adults: Anxiety disorders, relief of symptoms of anxiety—Valium (diazepam/Roche) tablets, 2 to 10 mg b.i.d. to q.i.d.; or 1 or 2 Valrelease capsules (15 to 30 mg) daily. Acute alcohol withdrawal—tablets, 10 mg t.i.d. or q.i.d. in first 24 hours, then 5 mg t.i.d. or q.i.d. as needed; or 2 capsules (30 mg) the first 24 hours, then 1 capsule (15 mg) daily as needed. Adjunctively in skeletal muscle spasm—tablets, 2 to 10 mg t.i.d. or q.i.d.; or 1 or 2 capsules (15 to 30 mg) once daily. Adjunctively in convulsive disorders—tablets, 2 to 10 mg b.i.d. to q.i.d.; or 1 or 2 capsules (15 to 30 mg) once daily.

Geriatric or debilitated patients: Tablets—2 to 2½ mg 1 or 2 times daily initially, increasing as needed and tolerated (see Precautions). Capsules—1 capsule (15 mg) daily when 5 mg oral Valium has been determined as the optimal daily dose.

Children: Tablets—1 to 2½ mg t.i.d. or q.i.d. initially, increasing as needed and tolerated (not for use in children under 6 months). Capsules—1 capsule (15 mg) daily when 5 mg oral Valium has been determined as the optimal daily dose (not for use in children under 6 months).

INJECTABLE: Usual initial dose in older children and adults is 2 to 20 mg I.M. or I.V., depending on indication and severity. Larger doses may be required in some conditions (tetanus). In acute conditions injection may be repeated within 1 hour, although interval of 3 to 4 hours is usually satisfactory. Lower doses (usually 2 to 5 mg) with slow dosage increase for elderly or debilitated patients and when sedative drugs are added. (See Warnings and Adverse Reactions.) For dosages in infants and children see below; have resuscitative facilities available.

I.M. use: by deep injection into the muscle.

I.V. use: inject slowly, take at least one minute for each 5 mg (1 ml) given. Do not use small veins, i.e., dorsum of hand or wrist. Use extreme care to avoid intra-arterial administration or extravasation. Do not mix or dilute Valium with other solutions or drugs in syringe or infusion flask. If it is not feasible to administer Valium directly I.V., it may be injected slowly through the infusion tubing as close as possible to the vein insertion.

Moderate anxiety disorders and symptoms of anxiety, 2 to 5 mg I.M. or I.V., and severe anxiety disorders and symptoms of anxiety, 5 to 10 mg I.M. or I.V., repeat in 3 to 4 hours if necessary; acute alcohol withdrawal, 10 mg I.M. or I.V. initially; then 5 to 10 mg in 3 to 4 hours if necessary. Muscle spasm, in adults, 5 to 10 mg I.M. or I.V. initially, then 5 to 10 mg in 3 to 4 hours if necessary (tetanus may require larger doses); in children administer I.V. slowly; for tetanus in infants over 30 days of age, 1 to 2 mg I.M. or I.V., repeat every 3 to 4 hours if necessary; in children 5 years or older, 5 to 10 mg repeated every 3 to 4 hours as needed. Respiratory assistance should be available.

Status epilepticus, severe recurrent convulsive seizures (I.V. route preferred), 5 to 10 mg adult dose administered slowly; repeat at 10- to 15-minute intervals up to 30 mg maximum. Repeat in 2 to 4 hours if necessary, keeping in mind possibility of residual active metabolites. Use caution in presence of chronic lung disease or unstable cardiovascular status. Infants (over 30 days) and children (under 5 years), 0.2 to 0.5 mg slowly every 2 to 5 min., up to 5 mg (I.V. preferred). Children 5 years plus, 1 mg every 2 to 5 min., up to 10 mg (slow I.V. preferred); repeat in 2 to 4 hours if needed. EEG monitoring may be helpful.

In endoscopic procedures, titrate I.V. dosage to desired sedative response, generally 10 mg or less but up to 20 mg (if narcotics are omitted) immediately prior to procedure; if I.V. cannot be used, 5 to 10 mg I.M. approximately 30 minutes prior to procedure. As preoperative medication, 10 mg I.M.; in cardioversion, 5 to 15 mg I.V. within 5 to 10 minutes prior to procedure. Once acute symptomatology has been properly controlled with injectable form, patient may be placed on oral form if further treatment is required.

Management of Overdosage: Manifestations include somnolence, confusion, coma, diminished reflexes. Monitor respiration, pulse, blood pressure; employ general supportive measures, I.V. fluids, adequate airway. Use levaterenol or metaraminol for hypotension. Dialysis is of limited value.

How Supplied:

ORAL: Valium scored tablets—2 mg, white; 5 mg, yellow; 10 mg, blue—bottles of 100 and 500; Prescription Paks of 50, available in trays of 10; Tel-E-Dose® packages of 100, available in trays of 4 reverse-numbered boxes of 25 and in boxes containing 10 strips of 10.

Valrelease (diazepam/Roche) slow-release capsules—15 mg (yellow and blue), bottles of 100; Prescription Paks of 30.

INJECTABLE: Ampuls, 2 ml, boxes of 10; Vials, 10 ml, boxes of 1; Tel-E-Ject® (disposable syringes), 2 ml, boxes of 10. Each ml contains 5 mg diazepam, compounded with 40% propylene glycol, 10% ethyl alcohol, 5% sodium benzoate and benzoic acid as buffers, and 1.5% benzyl alcohol as preservative.



Letters to the Editor

Dear Editors:

On September 23, 1983 MMA sponsored a leadership conference for the House of Delegates, the officers, and trustees plus other interested members. It has become apparent that there are many forces affecting the delivery of medical care to our patients. Cost containment has become the watchword, and payment to both hospitals and physicians is going to be related to the DRGs. There will be a great deal of cost produced by the government regulatory agencies for the tremendous amount of record keeping needed by both the hospitals and physicians, the PROs, and other regulatory personnel, to say nothing of the additional costs of administration by third party payers.

Many of us are concerned that this bureaucracy and regulation will likely to do little to save costs even though hospitals and physicians are scheduled to take significant payment cuts. Quality of care is in jeopardy.

Patients in my office seem to be most concerned about catastrophic illness and quality care at an affordable cost. In Minnesota the average insurance cost for a family of four has risen to \$2,100.00 per year. For we to insure simply for catastrophic illness the cost of coverage would be far less, perhaps in the \$400.00 to \$500.00 range leaving about \$1,500.00 for all the rest of health care.

I propose that the \$1,500.00 of health care money each employer would have left over after paying the catastrophic illness be placed in a money management account that would draw significant interest. The patient would be free to draw against this amount of money for his health care needs by submitting the appropriate documents. If the patient did not use this amount of money in a given year, any funds left over would continue to accumulate and be available for his/her health care needs.

I would further propose that we ask our congressmen and senators to pass legislation allowing these accumulated funds to be given directly to the patient at age 65 in a similar fashion to the present IRA. In a sense patients could have first dollar coverage if they chose to use this money. They, I feel, would wisely use their funds since it would be obviously to their advantage to purchase their health care carefully. Not only would funds be going directly for health care needs but patients would have jurisdiction over how they wanted to spend their health care dollar. The carrot at the end of the stick would be the fact that at age 65 they would have a significant amount of money which would also take some of the burden off the social security system.

In the past there have been somewhat similar proposals in both Louisiana and Oregon, but to the best of my knowledge the associated IRA concept has never been included. Perhaps MMA could help affect a significant change in health care payment, so that once again the patient becomes #1 rather than a pawn of bureaucracy.

Charles E. Lindemann, M.D.
Minneapolis, Minnesota

Dear Editor:

Despite the efforts of recent months to encourage increased member participation, and to better live up to its stated mission to represent the medical profession, the MMA remains, in many ways, a house divided. Many of our profession, myself included, have perceived the Association's past efforts as aligning itself too often with traditional fee-for-service medicine and encouraging its membership to oppose most of the challenges that threaten the status quo. With such a bias, the social, economic and political changes we all observe daily appear to be translated into base arguments over turf. Regardless of our

LETTERS TO THE EDITOR

position on the issues of the day, we all await a more enlightened dialogue from this profession whose foundations have always been rooted in the timeless call to serve. This letter comes to invite such a dialogue.

An ever-increasing variety of alternate health care delivery systems stands ready to serve the needs of the people of Minnesota. In this highly competitive marketplace, the fee-for-service physician who heretofore had found his platform and his ally in the MMA now finds that his is merely one voice among many. Unfortunately, though purporting to value the diversity of its membership, the MMA still often positions itself in support of the fee-for-service physician, with less regard for the views of its other constituency. The following is a list of some examples:

- The invitation to the September regular meeting of the Ramsey County Medical Society announced a program presented in large part by the MMA aimed at teaching us "how to meet the challenges" of pre-paid medical care.
- In its lengthy Report on Health Care Competition and Regulation adopted by the Board of Trustees in January, 1983, the MMA noted that "fee-for-service arrangements through health insurance indemnity plans offer the consumers the widest choice of providers and minimize barriers to care."
- The Report correctly notes that most Minnesotans feel that health care is too costly. Yet, continued admonitions that "measures to contain cost must be made without adversely affecting quality of care" are used to suggest that those of us in pre-paid medical care are involved in excessive pursuit of "cost containment measures which can impair quality to the detriment of the patient."
- The letter of overview which accompanied this Report stated that "the system by which we pay for our health care is a part of the problem. We pass along the cost for our care to an anonymous third party payor (insurance and health maintenance organizations) which removes the feeling of responsibility for health care decisions and costs from both consumer and provider."
- In the Annual Meeting of the MMA, a panel of ethics of pre-paid medical care included remarks by the President of our Association, Dr. Donald C. Bell. Wearing the mantle of ethical enquirer, Dr. Bell chose this forum to relate an anecdotal conversation with a disgruntled physician which indicted pre-paid medical care in a most uncharitable and accusatory fashion.

These and other allegations continue to widen the gap between the members of the profession and present, to the observing public, a picture not of diversity, but of petulance and peevishness.

In the past year, pre-paid medical plans enrolled record numbers of Americans with a total growth of 10% to a figure which approached nearly 12% of this country's population. Fully a fourth of the population of the Twin City Metroplex belongs to HMOs. Those of us in pre-paid health plans are not "anonymous third party payors". We are, instead, actively engaged in the provision of quality medical care with the same concern for our patients that our fee-for-service colleagues have. Many of us support the Association in our dealings with the public and it is important that the Association does not present a biased view either from our perspective or from that of our colleagues.

The MMA mission statement includes a pledge "to promote quality available care at a reasonable cost." The mission statement of Group Health, Inc. contains a similar pledge — "to provide high quality health services that are personalized, appropriate, accessible and affordable". These two statements of intent might have come from the same pen. Everyone would agree that despite this apparent similarity of purpose differences do exist. I am only concerned that we enter into a discussion of these differences with open mindedness, and even while pursuing our own enlightened self interest, that we do so with grace, and with the full knowledge that somehow we are all in this together.

John W. Wheeler, M.D.
Associate Medical Director
Group Health, Inc.

Shortening Hospital Stay — The Group Health View

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HOW DOES A provider of medical services survive in the health care market today when faced with declining resources, spiraling inpatient costs and consumer pressure to lower the cost of services while maintaining the quality of care?

To deal with this dilemma, Group Health Plan, Inc. in Minneapolis-St. Paul has instituted numerous projects to shorten length of stay. The details of these activities will be dealt with in subsequent, individual publications.

Several factors have entered into the decision to shorten the length of stay and exert other controls of hospital utilization.

Financial

The burgeoning hospital costs are by no means new, but have become a national problem of great concern pervading the entire practice of medicine. The Department of Health and Human Services has cited an average increase in hospital costs of 19.2% annually for the last three years, while the overall increase for all medical care costs was considerably lower, at 11% per year. To illustrate the acuteness of the problem, Blue Cross-Blue Shield paid \$445.00 a day in Twin Cities hospitals in 1982, up 21.9% from the year before. Statewide averages were \$391.00 and 20.6% respectively for those same subscribers.

Using the average cost of a hospital day in Minnesota of \$400 during 1982 as an example, we can appreciate the magnitude by which hospital costs can grow each year using the "Rule of 72". If one divides the annual rate of inflation for hospital bed-days into the number 72, the number of years it will take for the cost of a bed-day to double can be calculated. A rate of \$400 per day (for a postpartum mother and baby for example) will double to \$800 in only 3.8

years, and two years later that same mother and baby will cost their underwriter (and consequently the subscribers) \$1,132 per day. With approximately 50% of the health care dollar being spent in the hospital, the need to contain hospital costs by reducing hospital utilization and length of stay has become a top priority.

Length of Stay

Historically, the length of stay in Minnesota has been prolonged, particularly in postpartum length of stays. This is a key area to be addressed later, since this is the largest single group of essentially healthy patients who utilize the hospital for management of a physiologic process. Other parts of the country have been more successful in containing the cost of obstetrical stays, for example. Many of the larger insurers have been slow to change their methods of reimbursement to encourage outpatient use of the hospital, or the use of free-standing surgical centers.

Pre-existing Programs

The well-established Group Health Plan nurse midwife service, and an equally successful continuing care home nursing department are two examples of programs which lessen costs. It is very apparent that alternatives to hospital use, i.e. home care, will replace some traditional medical care in the hospital. It should be emphasized that the several nurse midwife programs in the Twin Cities area deliver infants only in the hospital, under close supervision of an attending physician.

Consumer Interest

Nationally and locally, patients and their employers have begun to take an active interest in assuming more responsibility for their own health, as exemplified by "wellness programs", than ever seen previously. This trend, coupled with less dependence on institutional care, are positive indicators that the consumer will be receptive to alternatives to hospital care.

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Surplus of Services

Considering the surplus of physicians and hospital beds, particularly in urban areas, established medical institutions are faced with many difficult choices to make in the years to come. Walter McClure of Interstudy recently stated in a local televised news program, "I don't see any hospitals or medical schools lining up to commit suicide."

Considering these five compelling factors, health maintenance organizations have an obligation to their

subscribers and a unique opportunity inherent in their structure to take steps to assure that hospital costs and utilization are controlled.

It is logical to assume that hospitals will increasingly become facilities which provide care during acute illnesses and injuries, labor and delivery, and major surgery. In the near future, outpatient diagnostic studies, outpatient surgery, and home nursing services will dramatically decrease the traditional hospital utilization.

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As A Corporate Executive Sees Us†

LEWIS LEHR*

I DO TAKE seriously your challenge to speak frankly about how others see the medical profession. I am going to address this subject from several different perspectives. In other words, I come here tonight with several different hats to wear.

The first is as a representative of a company that is very much involved with the medical profession . . . as a manufacturer of a broad line of medical, surgical, orthopedic, dental and pharmaceutical products.

My second hat is as a representative of the company with the largest industrial payroll in Minnesota. That makes 3M one of this state's largest customers for health care services, through our employee benefit programs.

My third hat will be my own, as an individual observer who has worked closely with the medical profession for most of my 35 years at 3M.

Let me begin with the perspective of a company that is deeply interested in health care issues. You don't need me to tell you that the image of health care is changing. We are living through an era of high technology and higher costs, an era of ever-deeper government involvement, and an era of more sophisticated better-educated consumers. We know that as people become more educated, they become more cynical about all institutions. The medical profession is no exception. The day when doctors could feel completely secure on the pedestal of public opinion is long gone. As a businessman, let me say . . . "welcome to the club."

I don't know of anyone who has felt this kind of public pressure more intensively than the business community. So for once I feel qualified in talking to a group of professionals such as this one. The pressure is doubled for companies which might qualify as "Big Business". It might also be said that a business or profession has not arrived . . . until all kinds of people are lecturing it on how to conduct its affairs. We have seen a good example of this process in the past few months with AT&T. Here is a company which has built the finest telephone system in the world, bar none. If you have ever tried to place a long-distance call in many countries abroad, you

know what I mean. Yet AT&T's very success has led to a host of problems which culminated in the breakup of the company this year. We are now treated to the spectacle of the courts, the Congress and various state agencies arguing what the surviving companies can make and sell. I could cite many other cases. But the medical profession's experience is in some ways parallel to the business community's. In other ways, it has been quite different.

For medicine, the great success you have had in pushing back the frontiers of technology has led to most of your problems. I am told that more than half of the treatment modalities that exist today did not exist 20 or 30 years ago. People survive now who would have died then. That is a pretty fair definition of success. But the new care is extraordinarily expensive. Medicine is blamed for the cost of its progress. So we come to the major issue: holding down costs. At 3M, some costs and spending are discretionary. But in medical practice, a great many expenditures are not discretionary. Lives are at stake. No one is likely to accept the death of an aged parent or a premature baby as a cost-cutting measure. People without resources do not expect to have access to all of 3M's products and services. But these same people do expect — and demand — access to all of medicine's products and services.

As you well know, this combination of rising costs and demand for services has sparked a national debate. This debate will not be settled by you . . . it will not be settled by me. It will eventually be settled by our society as a whole . . . but only when we come to grips with some difficult choices about the cost and delivery of health care.

The message I want to bring you this evening is this: It is absolutely essential that the medical profession contribute to this debate as creatively as possible.

But I have to say that, so far, I don't think the profession is perceived to have been as effective as it could be. This is ironic. There is no group which has embraced and adapted to change more successfully than doctors. Yet too many people still perceive doctors, as a group, basically resistant to change. If this image continues you may well find that the medical profession is more or less permanently on the defen-

*Chief Executive Officer, 3M Company, St. Paul, Minnesota.

†Reprinted from Ramsey County Medical Society's Bulletin, 76:7:13, October-November, 1982, by permission.

sive about health care. Once you are on the defensive, it becomes more and more difficult to get your side of the story heard. Believe me, it took us a long time in business to recognize that fact. First, for 50 or more years we avoided public policy like the plague. Then during the debates over regulation and the environment in the 1970s, too many business people instinctively dug in their heels and went on the defensive.

People began to see business as simply resistant to all change, strictly interested in profits. It was not until business people recognized the need to go on the offensive . . . to take the lead in proposing creative change . . . that our opinions were heard. I believe that is why we have had so much success at 3M with our programs for pollution prevention and energy conservation. Instead of simply debating these issues . . . we realized that we have to get out in front and propose some solutions. I think the same strategy will be necessary for you. If the medical profession has a weak spot, it is in communication . . . in marketing.

Marketing is a concept that is alien to most professionals, and certainly to most doctors. It conjures up an image of slick advertisements in magazines and on television . . . a catchy slogan and a hard sell. In fact, every successful business learns that there is far more to marketing than just the creation of a favorable image. Marketing is more than simply producing the good news. *Above all, marketing involves a keen awareness of one's environment . . . an appreciation of its needs and expectations.* What would a marketing approach involve for the medical profession?

Right now the debate over health care is focusing almost entirely on cost, and very little on quality. Obviously, we need to look at both factors to make an intelligent decision. Your product goes by the same name as the product of the 1950s and 1960s, when we were spending 5 or 6 percent of GNP on health care, instead of nearly 10 percent today. But it is not the same product today. Most of the drugs and techniques you are using now did not exist then. Did they do bypass surgery extensively 30 years ago? Did they implant pacemakers? Did they use dialysis?

The answer, of course, is no . . . they did not. You may think that most people understand the implications of these changes. I don't believe they do. Of all the professional groups in our society, none has a higher sense of internal discipline and quality than medicine. That sense is expressed in many ways: in surgical committees . . . in medical staff meetings where cases are reviewed and critiqued . . . in departmental committees which evaluate results, in comments on published research. I don't know of any other profession that maintains controls such as

these. *I doubt very much that the public knows about them.*

Let me propose an experiment. I would suggest that you look back over the many stories on health care costs which have appeared in newspapers and magazines in the past year or so.

If they do not highlight this side of the story . . . the improved technology and outstanding quality of American medicine . . . then the medical profession has some work to do. You have a terrific story to tell. Your story will not remove all the concern about the cost of health care. But it will go a long way toward *balancing the debate. Your story is needed to help our society make up its mind about what it really wants from our health care system.*

You can bring your story to the community in any number of ways. One good way to do this is to provide speakers for Kiwanis and Rotary clubs, women's groups and other service organizations. Another way is to participate actively in local organizations such as Chambers of Commerce. I can assure you that few topics will be received with as much interest as health care. Of course, marketing means more than talking. *Marketing also means listening . . . finding out what the consumer is thinking.* Right now, what we are hearing from the consumers is a real concern about the cost of modern medicine and as in most crusades they cite the unreasonable and skim over the reasonable.

The message for all of us in the health care industry, including 3M, is that we need to take the lead in finding ways to reduce costs, while maintaining quality care. *It is up to us to explain the problems fully and propose the solutions, before someone else does it for us.* All of this leads me to put on the second hat I brought tonight . . . that of a health care consumer.

As you know, 3M is one of the largest employers in the state of Minnesota. Through our various benefit plans, we pick up most of the medical expenses for some 22,000 3M employees and their families in this state. Naturally we are concerned about these expenses. In the interests of our stockholders, employees and customers, we have an obligation to try to purchase quality service as economically as possible. To this end, 3M has been taking a careful look at our Employee Health Care Program. In doing so, we have tried to address the concerns of both our employees and their physicians for quality medicine.

Many physicians . . . including some here tonight . . . have pointed out that benefit programs many times aggravate cost problems. Too many programs encourage demand for services which are either unnecessary or not cost-effective. The president of the

American Hospital Association, Alex McMahon, warned a few weeks ago that most consumers have few cost-savings incentives . . . "because under the present payment system, they are insulated from hospital costs."

At 3M, employees share in a portion of their medical bills through deductible and co-insurance provisions. The employees' portion is large enough to get their attention . . . but not large enough to discourage them from seeking needed care. Many plans cover certain procedures only if they are performed in the hospital. The same procedure is not covered for outpatients. 3M's major plan makes no distinction between tests or surgery performed inside the hospital or outside. Our philosophy in all our health benefit programs is to work as closely as we can with physicians. As just one example, we have recently added an alternative care provision to our benefit programs. Now, the benefits administrator can add coverage in specific cases . . . when the treating physician and 3M's consulting physician agree that an alternative procedure would be better for the patient.

In the same spirit of working with physicians . . . 3M is participating in the Private Hospital Review Program, through the Foundation for Health Care Evaluation. Allow me to tell you why we are part of this program. First, the Foundation is a physician-sponsored organization. It gives us an opportunity to work with doctors and hospitals to tackle the problem of health care costs . . . before a solution is imposed upon all of us by some governmental unit. Second, the private review process is anchored firmly in the philosophy of private practice. As you well know, quality and quantity reviews are now in use at HMOs, Preferred Provider Organizations, insurance companies . . . even Blue Cross/Blue Shield. We believe that our experiment here in Minnesota gives fee-for-service professionals a means to demonstrate that they can remain competitive in delivering efficient medical care.

Third, in our experience, there have been very few disagreements between the Foundation and doctors in private practice. Even so, hospital stays for 3M employees and their dependents were down by five thousand days in 1981. If you multiply those five thousand days by a cost of \$300 a day for a hospital room, you can see why we need to address the cost problem. We understand that overall hospital usage was down across the board in the Twin Cities area last year, so we will want to do more evaluation of potential savings.

Let me make it clear, however, that no matter what the savings, no one at 3M will ever settle for less than

the best quality health care. We are trying to find a more economical way to purchase the same quality product, but we will never compromise on quality for any reason. This might be a good time to clear up another rumor which I understand has been circulating. 3M is not about to build or buy a hospital for our employees . . . at least not until we hear that a group of doctors has gone into the tape business. So with this second hat I ask not only that you speak out on quality and innovation, but to be concerned about the cost and cost effectiveness of health care.

Let me close by putting on one more hat, and this time my own. Some of you may know that I was associated for many years with our health care products businesses at 3M. One of the reasons I did not feel uncomfortable with the subject matter tonight is that 3M and I have had the benefit of so much help and advice from the medical profession over the years. In fact I can say that our health care products business would be nowhere near as successful as it is today without the advice, support and creativity of thousands of doctors. One of our first major products, the Steri-Drape surgical drape, was at least in part the brain child of three surgeons from Cleveland who brought the idea to 3M. They participated with us during the years it took to develop the drape . . . offering us advice and encouragement. From the 3M tape lab, our business has expanded to include Riker Laboratories, "Sarns" brand heart-lung surgery equipment, "McGhan" brand surgical implants, "Bird" brand respiratory care products and hundreds of other products developed in our labs from the ideas and suggestions of you and your peers. We are now working in some form or other with most significant medical centers in the United States and many abroad.

As someone who has worked with our health care business for many years, I know what debt 3M owes to the medical profession . . . and what a debt society owes to you for your research and innovativeness. I know the profession is in a period of very rapid, and sometimes very trying, change. The national debate on health care will to a great extent determine the shape of your profession for years to come. I have seen hospital boards go from heavy MD membership — to no MD membership — and now back to MD membership. The latter is the kind of participation that is needed for cost-effective quality care. I've seen medical research go from private funding to near total federal government funding — and finally back to heavy private funding. And with private funding comes more concern for the cost of research.

We are returning to a total participation concept

and concern for health care — and this is the best antidote for the demand for socialized medicine.

That is why I have come here tonight to ask you to participate in not only the debate — but also the event . . . to take the lead in suggesting and participating in solutions to problems of health care cost and delivery. It is no exaggeration to say that the whole country is watching the Twin Cities for clues about the future of health care. For a long time, our area has been a hotbed of medical innovation . . . because of the University of Minnesota, Mayo Clinic, our fine hospitals and their staffs and our concentration of health

care products manufacturers. Now the Twin Cities . . . one of the birthplaces of HMOs . . . have become a hotbed for competition in non-government health care delivery. The wave of the future in health care may very well be building now . . . right here in Minnesota.

There is no one more qualified than you to shape the future of health care in America. But there are plenty of less qualified people who are anxious to try, if you do not.

I hope you will take the lead. If you do, all of us will be the better for it.



William E. Jacott, M.D., AMA delegate from Minnesota and member of the AMA Council on Medical Education, makes a point at the MMA 1983 Leaders Conference. (Photo by Roger Johnson)

The Minnesota Coalition on Health Care Costs

Employer-Provider Relationships*

ROBERT BYNEARSON†

ON BEHALF OF the entire Coalition board and Coalition participants, we appreciate your willingness to hold this meeting and to further encourage dialogue between trustees and employer representatives. We are aware of the unique hospital trustee leadership in the Twin Cities. We expect to learn more about you today, your role in encouraging change and how the Coalition, and in particular the employers, can work with you to encourage constructive community change in our health care system.

A Brief Look at the Coalition

In my brief comments this afternoon, I was urged to begin with a brief look at the Coalition, where it is and where it may be headed in the next few years. In particular, I shall touch on growing employers' awareness of the cost problem and their strong resolve to be a major part of the solution.

Sunset and Sunrise

First, some introductory comments on the Coalition. The Coalition is now two and three fourths years old. As you may be aware, the Coalition was originally chartered with a sunset provision. It was chartered for a three year period through June 30, 1983.

This past year the Coalition board has looked at its original mission, has reviewed progress, solicited input from the community and determined:

- An organization such as this is needed in the community to help work the health cost problem, and,
- The Coalition, with some adjustments and modifications should be rechartered for another three years, through June 30, 1986. Another sunset decision will need to be anticipated prior to that time.

Changes in Coalition

What are some of the adjustments and "tuning" we feel should take place as we approach another three year working period? The major changes are as follows:

Inter-Organizational Alliances

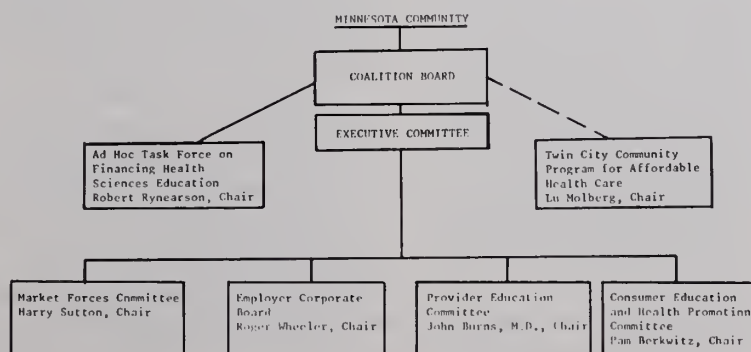
We have had good board and committee representation from the key actors in the community. In addition to the individuals, however, we want the organizations, that is, the hospitals, trustees, business partnership, and other employer groups, medical associations, health insurers, union/labor and consumer groups to feel an ownership in the Coalition. We hope to accomplish this change by formally requesting representation on the board and certain committees through the representative organizations. Also, we hope that some organizations will formally endorse

*Based on presentation to a joint East/West Metro Hospital Trustee Meeting, March 8, 1983, in Minneapolis.

†Coalition Board Chairman and Vice President and Staff Executive, Avionics Systems Group, Honeywell, Inc.

MINNESOTA COALITION ON HEALTH CARE COSTS

OVERALL ORGANIZATION CHART



and become part of the Coalition. This includes the provider associations, third party, labor government and business groups. In the business area we hope, for example, that MACI, the St. Paul and Minneapolis chambers and the business partnership will officially join the Coalition. We were pleased to help spawn and facilitate the Robert Wood Johnson grant application. That program and its governing board is a major step forward in building necessary alliances in this community.

A way to reinforce ownership is to ask participating groups to support the Coalition with either grant support or other forms of contributions and we will indeed, be pursuing such a direction. Employers (and health carriers) have provided 80% of the Coalition budget with approximately 20% from independent foundations. With the exception of a grant from the Hennepin County Medical Foundation, there has not been any financial support from providers. We not only welcome provider involvement in the Coalition, but also their financial support. We have a commitment from HMOs and expect that recent meetings with medical associations and hospitals will yield similar support.

Mission, Goals & Objectives

The original Mission and Goals of the Coalition served us well in the past years. We feel the organ-

ization's accomplishments have been many and substantive. We have a statement of accomplishments available for those of you who would want to review our progress.

At our last board meeting on February 1, 1983, we acted upon the major missions and goals of the Coalition that will guide our activities for the next 3 years (through June 30, 1986).

The kind of outcome we hope to achieve is related to lowering the rate of per capita health care expenditures in the Twin Cities and state.

Employer Participation in the Coalition

The third area of change in Coalition structure involves employer participation. As we have mentioned, employers have been the major source of financial support to the Coalition. While they have participated in the many task forces and committees of the Coalition in past years, our assessment of the past two years showed that we have not sufficiently helped employers plan for the difficult changes they must make to get a handle on the health cost problem and to execute change in the best interests of the company, its employees and the overall community. Accordingly, our board has recently formed a new program thrust within the Coalition structure. (See Coalition Organization Chart) This new structure is called the Employer Corporate Board and will build employer

The Coalition mission is to . . .

Coordinate and initiate resource groups representing all elements of the statewide community. Through a coalescence of effort, these diverse elements can bring about changes in the health and health care environment that promote improved health and assure access to appropriate quality, cost-effective and affordable health care.

The Goals and Strategies to fulfill this mission are:

1. To bring and keep together an inter-organizational alliance that can jointly accomplish improvements in health and health care costs.
2. To encourage positive incentive-oriented changes and cost savings in health care delivery.
 - a). To reduce the inappropriate demand for health care services, through changes in benefit structures and reimbursement policies that promote cost sensitivity for both providers and consumers and
 - (1). Encourage and promote a plurality of competitive health care plans and practices.
 - (2). Promote price and information disclosure to facilitate exercise of cost-effective choice.
 - (3). Promote restructured benefit policies that reward cost-effective behavior.
- b). To identify and eliminate barriers to a free market approach to health care delivery.
 - (1). Monitor current health legislation and recommend appropriate community response.
 - (2). Identify existing legal and programmatic barriers for community action.
 - (3). Communicate with business leaders, opinion makers, legislators, consumer organizations to influence policies and practices effecting health care economics and quality.
3. To monitor trends in health service prices and facilitate evaluation of the economic and quality impact of changes in health policy and alternative delivery forms.
4. To educate consumers (including the business community and governmental units), through existing and new community and business channels, in areas of:
 - a). Availability and details of alternative forms of health care financing and health care practices.
 - b). Health promotion activities and opportunities.
5. To educate providers in practice styles which are conservative of resources, without compromising the desired health outcome.
 - a). To support effective quality and price surveillance and utilization review in all delivery plans.
 - b). To encourage research in outcome evaluation techniques.
6. To respond to new issues and opportunities that effect the health and health care environment in Minnesota.

resolve and strategies for being cost-effective purchasers of health care. An example is related to the recent emphasis in hospital and physician price disclosure. There are many interests evident in seeing price information shared in the community. The interests of the State Department of Health, planning agency and State government may be a different focus than that of employers. The employer group will help define the employers' needs for price information and will then work with the providers and carriers in the Coalition structure to provide such information in a rational and economical manner. This is just one example.

This group is also going to have to wrestle with the difficult problems of restructuring health benefits plans and improving the education and motivation of employees towards making wise health care purchase decisions. We are pleased that Roger Wheeler, Control Data and his counterparts at the 35 plus employers in the Coalition, will be shepherding this important working group. As you can see from the chart there will be an executive type steering committee of 15 employers or so, that will be meeting more frequently and creating policy options for the overall corporate board (which will eventually meet 4 to 6 times per year).

In addition, there will be a program committee made up of the employer executives that are most directly responsible for the design and administration of the health benefits program. This group will work to implement specific strategies for their companies and the aggregate of employers and will coordinate employer participation in other committees of the Coalition.

Employer Board

The Employer Corporate Board has met recently and is establishing their priority work list for the coming months. As they establish their workplan they will be meeting with other groups represented in the Coalition. Labor representatives are invited to meet with the employers at their next meeting to see where our agenda may be coordinated.

We see today's meeting with hospital trustees as a step in understanding further how we can work together and will be reporting our perceptions and conclusions of this meeting to the employer group in late March.

Let me leave you with a few concluding thoughts about the employers' motivation in containing health care costs.

Employer's Motivations

As you know, employers in this community have a very rich history of becoming involved in community affairs and problem solving. The Minnesota Coalition is looked upon as one of the "older", more mature of the 60-80 Coalitions, nationally. However, employers were active in the two-year cost commission study sponsored by MMA and were partners with local insurers in the mid 60s in the Twin Cities Health Development Institute. The Institute helped spawn and support the pluralism in health plans we currently have available. When viewed in this context we see that Twin Cities employers have been "coalescing" with providers and payers on health care delivery issues longer than perhaps is the case in many other communities.

This history helps explain employers' current respect for working with providers, payers and consumers in shaping further accountability into the health delivery system. The Coalition remains as a major forum for this work.

In this rich history employers have too often emphasized changes in the provider community to the exclusion of the employer's role in shaping the perverse reinforcements for providers.

The HMO Problem

A poignant example involves the growth of HMOs in this community. In this community history we helped to encourage HMOs as a major cost containment strategy. Some employers put so much expectation on the HMO's approach without sufficient attention to the actuarial integration into the health benefits plan. Now that we see the unintended effects of "adverse selection" the tendency is to change that positive expectation to blame directed at the HMO. The HMO's structured design and community rate approach certainly is an underlying driver of the selection problem but the point is that employers in such an experience created the environment for such an effect. Employers did not sufficiently address their behavior and the steps they could take to assure choice in health plans while balancing the financial risk, I am sure there are many other examples in other provider relationships, ex. full coverage of hospital benefits and partial benefits coverage for less costly ambulatory care substitutes.

Basic Principles of Cooperation

Employers are therefore at a crossroads in this community which will place a high level of account-

ability for change on our own behavior. We are ready to take some of these difficult steps and in so doing, we will be coming to the provider community with a growing set of expectations for cooperation. However, the ground rules and environment will include some of these basic principles:

1. Our employees' health status and their health care resources are highly valued by the corporate community. We will not compromise access to high quality care for employees and their families.
2. The health care delivery system changes must be driven by a changing emphasis on positive economic incentives for cost effective delivery.
3. Employers and labor must be willing partners to changing health benefits plans.
4. Outcomes must be evaluated on the basis of per capita expenditures ... of employees in the firm, and citizens in the community. We see a number of positive forces underway in our community such as a lowering of hospital utilization (LOS and admissions) as well as a moderation

in price both hospitals and physicians. However, we have yet to see our work to date reflected in bottom line containment of the rate of per capita cost increases. The problem as employers see it is not how much we are currently spending on health and health care but the projected rate of increase if we continue to deliver and pay for care as we have been. We simply cannot afford 20% yearly increases and a doubling of costs every four to five years.

5. We will continue to pursue changes in financing and delivery by working with providers and payers, building our relationship upon economic incentives. This will lead to lasting and long term solutions rather than the adversarial relationship between employers and providers that exists in other communities across the country.

Thanks for the opportunity to share these brief thoughts with you and, again, your willingness to open the dialogue between employees and hospital trustees.

DRGs Workshop

The Minnesota Medical Association and the Minnesota Hospital Association are pleased to announce a jointly-sponsored workshop for physicians, trustees and administrators:

Preparing for DRGS

The ½ day program is designed to:

- Stress the need for physicians, trustees and administrators to work together in the interests of quality patient care during the transition from retrospective to prospective payment;
- Provide some tools for coping with DRGs; and
- Explore implications of DRGs for physicians and hospitals, and the relationships between the two.

The program is designed for maximum participation by medical staffs, trustees and administrators in a setting close to their own home community. Three or more hospitals are encouraged to collaborate in hosting the workshop.

Costs to be borne by host institutions include travel expenses, a minimal honorarium for the speaker, facility and meals. The Minnesota Medical Association and Minnesota Hospital Association will make no charges for the development of the program materials or its administration. Accordingly, host institutions are encouraged to make the program available without a per-person charge.

For information on program particulars, or to schedule the program in your area, contact: Carol J. Kaemmerer at the Minnesota Medical Association, (612) 378-1875; or Virginia Greenman at the Hospital Association, (612) 331-5571.

Preferred Provider Organizations

RICHARD J. FREY, M.D.*

THE PPO MOVEMENT is a broadly based response by a variety of medical care providers to a market in turmoil, a market that challenges the very existence of solo and small group fee-for-service practice.

On a background of limited resources that will be spent on medical care, vastly expanded technological capacity, and demonstrated growing physician excess, a competition for available economic resources must follow. The ability to compete in this scenario will in large part determine the structure of the health care system in years to come, as well as the role definition of those in the system.

Perception of Fee-for-Service Physicians

It has been the clear perception of most physicians depending upon fee-for-service payment that the viability of their practices is being threatened. No longer is it possible to compete for patients on the basis of established relationships, convenience, a more personal type of care, or whatever, without the added assurance that cost will be affordable. The efficiencies of a small office practice are real, but as an unstructured segment of practice, it is becoming increasingly unable to compete effectively with organized alternative delivery plans that utilize sophisticated marketing and advertising techniques, and are able to negotiate favorable payment arrangements. Understandably, the PPO concept offers a logical response to this void. Its broad early acceptance is somewhat enhanced by the legitimate concerns of both public and private third parties, as well as the corporate world, that the prepaid programs have done very little to stem intolerable escalation of health care costs. The fact that payers, including the government, consider the costs to be intolerable, in fact makes them intolerable, regardless of what physicians or hospitals may feel. The message is, in reality, a public consensus.

The Risks of PPOs

Although the PPO concept is appealing, the variety of structures and features should serve warning that many will be unable to meet their own expectations as well as those who may participate in their plans. The

physician component of a PPO by its very nature must operate under an umbrella organization, capable of assuming financial risk. Granted that this lends itself to hospital-based PPOs, corporate based, carrier based, or a broker arrangement, the potential for physician-contractual arrangements that perpetuate dysfunctional incentives is very real. Typical of this concern is the widespread use of negotiated fee discounts with reliance on peer review to control performance.

Limitations of Peer Review

In my view, we have already experienced the limitation of peer review mechanisms. Certainly, an essential part of performance control, utilization review standing alone to balance the negative incentives of a fee-discount feature, leaves little room for optimism. The hallmark of a successful PPO program in this competitive market must be substantial alteration in patterns of performance by both the buyer and the seller of medical care. Far more important than the physician's fee is his performance as a purchaser of care for his patient. Discounts punish the conservative, cost-effective provider. They aggravate the existing inequities in physician fees and encourage wasteful overutilization of other services to make up for the discounted fee. What meaning does a discount have if one is buying an overpriced product or service? I submit that discounts in fees of the decision-making physicians may be counter-productive as they perpetuate and augment the negative incentives in the existing system of payment.

Legitimate Enthusiasms for PPOs

Legitimate enthusiasm for a properly motivated and structured PPO is warranted. The need to more clearly identify appropriate care is enormous. Widespread variations of patterns of practice must be examined in terms of medical outcome. A conservative style of practice that accepts no compromise to quality must be identified and rewarded. It will no longer be possible to punish the efficient and expect excellence in performance. Serious and intolerable inter-disciplinary inequities in physician fees must be addressed, as we in partnership define price-

*Chairman of the Board, Minnesota Health Network and MMA delegate to AMA.

competitive programs.

At this time it may well be inappropriate to describe a precise prototype for a PPO. A recognition of a division of responsibility between the provider of care and recipient of care or his guarantor for appropriate utilization must not be wanting. Positive economic incentives for both parties must exist. Dollar-one coverage removes all economic restraints from the patient at the time of delivery of service. There is good evidence that co-payments do nothing to delay appropriate care to a more costly setting. A plan without clear lines of accountability is in trouble. There is no plan that can succeed without the commitment of its physician membership. Likewise, there will be no success without a sophisticated system for data collection and display, one that permits profiles of performance and lends itself to quality assurance.

Decision for Radical Change

The decision for radical change in health care de-

livery has already been made, not by any group of planners, not by government representatives, not by physicians, but has evolved as a product of a multitude of uncontrollable and unplanned happenings — social, economic, technological, demographic and ethical. The question is more one of adaptation to this change.

Will Fee-for-Service Survive?

Can private fee-for-service practice survive? It could, but it may not. It is apparent that it cannot survive exactly as we know it now. Structured to meet changing demands and opportunities, it may very well flourish in this unsettled market.

The PPO has the potential to bring a newly structured competitive model to the medical marketplace and serve far better than anything on the scene today to preserve the private practice of medicine with all of its benefits in terms of patient care and professional excellence.

Rheumatology Seminar V March 6-13, 1984

Location:	Paradise Grand Hotel, Nassau, BAHAMAS
Dates:	Departure from Twin Cities Airport on Tuesday, March 6 Return to Twin Cities on Tuesday, March 13 Educational Program — March 7-11
Fee:	\$285 (educational program) Approximately: \$1,378 per physician/\$324 per accompanying spouse or child (includes round-trip flight, ground transportation and accommodations for seven nights)
Faculty:	From the University of Minnesota and the Mayo Clinic
Content:	Common rheumatologic problems, diagnosis, treatment and the course of the disease
Hours:	20 hours, Category I/Prescribed
Contact:	Department of CME and Meeting Services, Minnesota Medical Association, Suite 400, 2221 University Avenue SE, Minneapolis, Minnesota 55414, 612/378-1875.

Preferred Provider Organizations

Analysis

THOMAS A. LOVE, M.D.*

TO BE OR NOT TO BE — that is the question. To be accepted or to be rejected — that is crucial. To be a have or have not — that is a dilemma. To be preferred or to be unpreferred — that is the issue.

The Concept of the PPO

The concept of a Preferred Provider Organization — PPO — is an anachronism becoming well known and commonly used to describe a collective pool of health care providers attempting to establish a share of the market in the health care industry in the competitive medical marketplace. A dozen years ago HMO was launched as a concept to corner a share of the market on a pre-pay basis and this abbreviation for health maintenance organization has become common place and fairly well understood by the medical provider community. It has taken a decade of discussion and penetration for the HMO concept to be analyzed and understood by the physicians, hospitals, and buyers of care. The concept of the PPO has not been around as long and is not quite so easily understood or as succinctly defined as a marketing entity. It has been described as an attempt of fee for service or private medical practice to compete and re-capture patients who might otherwise have made a choice to buy their medical care on a pre-pay basis rather than buying any variety of other marketed insurance plans.

PPO Organizational Activity

A flurry of PPO organizational activity has made itself known around the country starting, as usual, with the California medical community and permeating East, pushed by prevailing westerly winds. At this point in time it seems fair to summarize the progress of the PPO movement as being more discussion and formation than actual implementation or marketing. In most PPO movements a corporation or a hospital institution provides the seed money and organizational management structure to organize a pool of physician providers. Primary care physicians and specialty groupings are asked to discount their usual and customary charges and also accept standard concurrent or pre-admission utilization review procedures in an attempt to roll back cost and put some brakes on hospital utilization as the most expensive

portion of the medical dollar expenditure. Some hospital institutions have also offered a discount on their bed charges.

The Savings of PPOs

My concern for the future endeavors of the PPO organization movement is that a short-term discount solution may result but I cannot see that long-term savings in true medical costs will result. If one views the tremendous cost shifting that has occurred in the past few months, wherein an organization bargains with a hospital to receive a discount from the hospital in return for sending the organization's patients to that hospital, then a short-term benefit accrues to the bargaining organization. The hospitals to date have shifted the costs to other payers of care, rather than making concerted and innovative efforts at cutting costs and probably the quality of some of their hospital services. Cost shifting has not produced a true cost savings to the total medical community. I think the analogy might hold true for the bargaining and positioning by various preferred provider organizations in short term positioning for discounts.

The past decade has educated the provider community in concurrent and utilization review as well as pre-admission screening and decision making in regards to the necessity of hospital usage. We have learned to make conservative and judicious decisions about admitting to hospitals and there has been a resultant cut-back in the number of patients admitted to the hospital and therefore cost savings. How much more cost savings can be milked out of these efforts in the future is a pertinent question! Many physicians are beginning to feel that further reductions in hospital admissions will look more like rationing than trimming away of the fat of over-utilization.

Savings Outside Institutions

It seems apparent that efforts at judicious usage of the hospital and alternative methods of delivering care and services in procedures outside of the expensive institutional setting should be vigorously pursued. The thrust of the PPO movement is an attempt to organize the concerted efforts of a network of physicians in negotiated fee structures and the promise to deliver patients to the physicians, in return for a discount and an honest attempt to truly emphasize the

*St. Paul Surgeon.

necessity for screening review and analysis of the decisions to admit patients to the hospital, in as cost-effective manner as possible, without sacrificing quality care. There are many hospitals which view this as a necessary step to survival. Many physicians are frightened and anxious about the diminished numbers of patients in their offices and hospitals and have the perception of market share being captured by active HMO marketing. Hospitals and some physicians see the alternative of a PPO as an acceptable first step in becoming competitive in the medical marketplace.

I would not argue with the decision of any hospital or physician to become involved in the numerous PPOs which are being submitted for consideration and the decision to be involved or not to be involved. I personally feel that the benefits, as described above, will be short term and more innovative and creative efforts seem necessary to achieve a more long term solution to the escalating costs of delivering medical care.

Health Care Design Inc.

Health Care Design Inc., St. Paul, is making an honest and concerted effort to analyze and design a health care delivery plan that will hopefully be a better solution in the future. Our thrust to date has been to actively involve physicians in the planning and designing process and analyze, from the perception of the physicians delivering care, some of the more meaningful ways that health care providers can deliver care in an efficient and comprehensive and conservative style. The best components of a prepaid plan or PPO can be incorporated into changing a style of practice but the physician community I believe, can come up with more thoughtful and helpful ways for the future besides the components of utilization review or discounted fees.

Hospital and Insurance Company Participation

Health Care Design has also invited hospital and insurance company participation in this planning and designing process. We think it also essential that buyers of care from industry, labor unions and small businesses and users of care be involved in helping to design incentives and means to cut down on expenditures.

Agreed Upon Decisions

A plan to be more comprehensive and totally effective in reducing costs must have agreement by buyers, providers, consumers, and insurers of the medical market care package. Each player in the drama can contribute and cut back and tighten the belt and make a much more total and meaningful impact on the total system. It may well be that physicians will have to accept less dollar reimbursement and that hospitals will have to trim away excesses of first-class care and that patients will have to have some brakes put on their utilization of care provided by the system. The insurance companies should also be at risk in this process and not just pass through its cost by raising premiums and maintaining its profitability margin in spite of the inflationary trends.

Basis of Preferred Designation

To designate one segment of a medical system as preferred and therefore implying that the rest of the system is unpreferred is onerous. The basis for preferred status is only the decision to accept a cut in reimbursement and agreement to actively participate in utilization review. These are insufficient solutions to the major problems that must be challenged and conquered in this decade of competition, inflation, and high demand in our health care system.

Cover Photograph

“Monument Valley, Arizona”

Dr. and Mrs. Charles Lewis were on a jeep tour of Monument Valley in Arizona in 1980 and came upon the lovely spot featured on the cover. An Indian was present in the location, and the tourists paid him to ride out to the vantage point in the photograph for picture taking.

Dr. Lewis was a family physician practicing in Henning, Minnesota from 1946 to 1980. His father, Dr. A. J. Lewis, started his medical practice in Henning in 1911 and Dr. Charles Lewis joined his father in 1946. He is presently retired, living in Cape Coral, Florida. Travel and photography are his special interests, in addition to enjoying two grandchildren. In his retirement he enjoys showing slides to friends and club groups.

MeSH — A Reasonable “For-Profit” Concept?

JAMES B. GAVISER, M.D.*

Physicians and hospital administrators are becoming preoccupied with the economic changes of medical practice. The new Diagnosis Related Groups (DRG) intensifies and complicates the relationship between the two groups. A new joint venture of physicians and administrators, combining medical and management skills, may help both survive and even thrive in the new economic environment. But achieving a MeSH (Medical Staff-Hospital) partnership will require time, money, and effort on both sides.

HEALTH CARE IS BECOMING a commercial enterprise. We are all feeling the effects as the practice of medicine evolves in a competitive environment shaped by spiraling costs, surplus physicians and beds, and the growing industrialization of medical care. No matter what our type of practice (group, academic, or solo), questions we never anticipated are arising around issues of quality, reimbursement, and our own individual values and goals.

Medical Industrial Complex

Few of us envisioned this scenario when we made the decision to embark on a medical education. We now find ourselves unprepared for, and uncomfortable with, the business jargon being applied to our profession, terms such as “return on capital,” “capitation,” and “at risk” are jarring to us.

Arnold S. Relman, M.D., editor of the *New England Journal of Medicine*, warned us of the emerging medical-industrial complex more than three years ago. Addressing the 171st meeting of the Massachusetts Medical Society, Dr. Relman stated that “physicians should derive no financial benefit from the health care market except from their own professional services.¹”

Becoming A Physician-Manager

Our dilemma as physicians is that our education and professional standards seem at odds with the business approach to medicine. In attempting to resolve this dilemma, we must recognize that for most of us our professional priorities include receiving financial reward as well as caring for people.

To achieve these priorities in today's competitive market, we need to preserve our ability to manage individual patients while also developing a capacity to

manage our overall practice of medicine. We need to bolster our medical expertise with additional skills and strengths. Only in this way can we position ourselves most advantageously against the large medical care corporations run by people unfamiliar with the practice of medicine.

Tying into A Larger Organization

But we cannot do this alone. Our need to tie into some form of larger organization is becoming more and more evident. The trick will be to tie into an organization as a partner, without becoming controlled by it.

The hospital represents the organization most familiar to us and the most ready opportunity for partnership, but our relationship with hospital administrators has been an unusual one at best. The motivations of administrators and physicians have rarely been in harmony, and recent cost-containment efforts may divide us even further. Specifically, the Medicare DRGs have the potential to trigger conflict, and the possible extension of DRGs to physician fees within the next two to four years could exacerbate that tension.

Interdependence of Physicians and Hospitals

At the same time, however, under prospective payment it is more important than ever for doctors and hospitals to recognize their interdependence, to acknowledge each other's skills and capabilities, and to work together to maximize the potential savings. As Young and Saltman point out in their article, “Preventive Medicine for Hospital Costs,” the cost of care may be influenced by one, both, or neither of the two groups — physicians and hospitals — involved in its delivery.² We are all aware of how physicians can manage patients with fewer tests and

*Consultant to InterStudy.

procedures when appropriate and how hospitals can operate more efficiently in terms of supplies, staffing, and capital equipment.

Need for A Joint Venture

One vehicle for facilitating hospital-physician cooperation is a joint venture that balances both parties' interests and offers incentives to both for being efficient and effective. As physicians it is in our interest to participate in such a venture for professional as well as economic reasons, because we are the most qualified to make decisions regarding care and utilization; we need to insure our continuing input into these decisions. We cannot afford to lose this function to either the federal government, hospital administrators, or the new medical care entrepreneurs.

As Dr. Relman, perhaps not tending to accede to the discourse presented here, said in his speech: "How best to ensure that the Medical-Industrial complex serves the interests of patients first and its stockholders second will have to be the responsibility of the medical profession and an informed public."³

MeSH (Medical Staff-Hospital Partnership)

A model for the kind of hospital-physician joint venture proposed above has been developed at Inter-Study by Paul M. Ellwood, M.D. This model, called MeSH (for Medical Staff-Hospital Partnership), provides for the creation of a separate corporate unit, half owned by the hospital and half owned by its medical staff. Its main functions are to facilitate the management of risk associated with prospective payment and to distribute incentives equitably to those responsible for managing risk. In addition, the MeSH organization can provide capital for expansion (e.g. into satellite clinics to broaden the patient base of the hospital and doctors). Also, because of its flexibility, MeSH can accommodate diverse payment arrangements.

Hospitals, HMOs, and PPOs have been active in some of these areas, but MeSH introduces the concept of a new firm, in which participants can invest money and interact as business partners. Equitable ownership of the corporation is crucial since in this way neither side can dominate the other. For non-group-practice physicians, a MeSH organization provides some of the selectivity and cohesiveness that have given group practice an economic advantage in the prepaid environment.

The MeSH concept calls upon us not so much to act differently as to think of ourselves in a different way. Obviously this new venture would be first built upon a relationship of mutual trust and solidified by appro-

priate legal agreements.

The details of these legal agreements would vary widely, depending on the interests and objectives of each group of MeSH participants. Under the central MeSH organization, discrete subcorporations, or MeSH plans, would be created to deal with each appropriate third party payer. For example, there might be a Medicare MeSHplan, a Medicaid MeSHplan, and an HMO MeSHplan. Each would include only those physicians who tend to deal with that particular payer.

How Does MeSH Work

For the purposes of illustration, we'll look at a MeSH set up to accommodate Medicare DRGs. The development and growth of a MeSH can be broken into four stages: (1) planning and education; (2) start-up; (3) operation; and (4) investment.

Planning and Education

During the planning stage, all the financial and legal aspects of the MeSH are negotiated. Participants in this process include eight to ten physicians, two or three administrators, and possibly representatives from the board of trustees.

The educational component of this makes it a time-consuming process. For MeSH to succeed, everyone needs to understand how it works and the underlying concepts involved. Getting the word out to the rest of the medical staff takes a minimum of six months.

The capital needed for the planning and educational phase is approximately \$35,000 to \$60,000. This is principally for attorneys in addition to other consultants used in fine tuning and negotiating an acceptable plan. The primary sources of this money are the hospital and physicians interested in becoming MeSH participants, with the possible additional funding from medical societies or foundations.

Start-Up

In the second phase — start-up — the MeSH staff is recruited and hired and the facilities established. The cost may range from \$50,000 to \$100,000, with the money coming from the same sources used in phase one. At this point the MeSH is not actually in operation and has no money coming in.

Using the dollar amounts outlined above, the capital need for planning, education, and start-up is about \$150,000. In the initial stages, the hospital is the principal investor, contributing perhaps two-thirds of the total, or \$100,000. The participating doctors provide the remaining \$50,000. If one hundred doctors are involved, the individual investment for each is the

\$500. Physicians should not expect a return on this original contribution. It's really more like paying an entry fee into an investment club.

Operation

The operation phase involves the actual provision of care, with anywhere from 25 to 100 percent of the hospital's medical staff participating. Ideally, about one half of those participating would be primary physicians. The optimum total number can be derived by estimating that one physician will be needed to fill two hospital beds.

For the operation phase of MeSH, the source of money is the particular third party payer around which each individual MeSHplan is organized — e.g., Medicare. The cash flow is from the third party to the hospital and participating doctors in the form of incentives from the third party to the MeSHplan and then to the hospital and doctors. A doctor could receive cash, have the money go toward a pension, or invest in an expansion of MeSH activities, such as satellites.

The amount of money that would be coming in at this stage is uncertain. DRGs are new, and as yet we don't know how much excess there is in the system. While there are some financial gains for doctors to be derived through savings from DRGs, buying into the MeSH investment club in itself does not provide for

large profits. The numbers do increase, however, once the MeSH starts developing more appropriate vehicles for investment, such as health networks.

Investment

In the investment phase, the MESH begins to expand operations. Joint physician-hospital enterprises might include new health networks such as satellite clinics, home health care, nursing homes, and intermediate care.

The amount needed would depend on the type of investment. For a satellite, \$1 million might be needed. The money would come from the hospital, doctors, and other investors and go toward real estate and contracting costs, doctors working in the satellites, and eventually back to the investors.

Summary

The medical environment has changed. We recognize that as a fact. The MeSH concept can help us to think of ourselves as participants in the new "business" environment. By complementing our concerns as physicians with the outlook of business people, we can ensure that we profit fairly and remain socially responsible.

Acknowledgment

Technical assistance in the preparation of this article was provided by Barbara Paul at InterStudy.

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1983 MMA Leaders Conference

Ronald D. Clark addressed the luncheon and advised the physicians that the public's optimism about advances in medicine is offset by concerns and confusion over the changes in the health care delivery system. (Photo by Roger Johnson)



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Practice Survival

MMA Developing New Marketing Programs

DELWIN OHRT, M.D.*

Marketing is a concept that is alien to most professionals, and certainly to most doctors. It conjures up an image of slick advertisements in magazines and on television... a catchy slogan and a hard sell. In fact, every successful business learns that there is far more to marketing than just the creation of a favorable image. Marketing is more than simply producing the good news. Above all, marketing involves a keen awareness of one's environment... an appreciation of its needs and expectations¹.

WE ENTERED AN era of relative and probably significant absolute physician undersupply after World War II. There were three major reasons: First, our population was growing rapidly with the baby boom. Second, more and more primary care physicians abandoned practices in primary care for specialty training. Students were more attracted to specialty practice than a career in primary care. Our educational institutions were limited in their ability to produce the number of primary care physicians the American people demanded to fill the void. Post-graduate training programs were equally limited in their output of manpower in some of the medical and surgical specialties. This situation persists to an extent today in some geographical areas. However, recruiting physicians for the less desirable areas in our State is far less difficult than just a few years ago. Third, there has been a mushrooming growth in technology which patients have expected to be used in diagnosis and treatment.

Patients in the post-war era found an increasingly complex and often less personal health care system. It was a seller's market, and the patient had to adapt to the system.

But was it always this way? Talk to those physicians who entered practice in the 1920s or 1930s. They tell a story of intense competition for the patient and his health care dollar, and there weren't many of those dollars during the Great Depression. The patients either knew or found out which physician offered the best service for the best price. The successful physician understood that market and designed a practice to accommodate it.

Changes in the Last Five Years

During the last half of the 1960s and through 1982,

*Chairman, Board of Trustees, Minnesota Medical Association.

the capacity of medical schools rapidly expanded to meet public demand for medical care. Foreign trained physicians found the United States a desirable practice climate. Medicine was such an attractive profession that young Americans, frustrated in their attempts to gain admission to American medical schools, turned to the foreign medical schools. A new category of medical school graduate began applying for the first post-graduate year training programs — the American born foreign medical graduate.

Steps have been taken by the federal government to curtail immigration of foreign medical graduates during the last few years. The medical schools are re-assessing class size, but are reluctant to reduce enrollment through fear of reprisals on their budgets. At least one state is developing a policy on licensing the American born foreign medical graduate.²

It would appear that there is little question that many areas of the country will have an excess of physicians. Add to this the pluralistic health care system which is developing, plus the pro-competition philosophy among third party payors, and we find ourselves moving rather rapidly from a market which was insatiable into one in which any one of us could fail. Consider the possible personal impact. Failure after seven to nine years of training and, for many, the accumulation of a large debt with "only a diploma" to show for it.

That is our world as I see it today.

The survival of a practice will depend on the physician's ability to sense his or her environment and meet the real and perceived needs of the patient. Dr. Charles McCarthy was the first to openly discuss marketing for physicians in his President's Letter in April, 1982.³ The subject has received much more attention since and marketing has even become something of a buzz word.

Minnesota Medical Association Marketing Program

The Board of Trustees established an Ad Hoc Committee on Physicians' Marketing Services at its April 23, 1983 Board Meeting. The committee is chaired by Thomas G. Briggs, M.D. The group acted quickly and ably to create a program which was endorsed by the Board of Trustees and adopted as MMA policy by the 1983 House of Delegates. In agreement with this resolution, a for-profit corporation was established by the MMA in September to oversee the offering of marketing services to MMA members. Through the Minnesota Medical Services Corporation, members of the MMA will benefit from the latest in technology and other products and services which seek to assist the physician to compete in the competitive health care marketplace.

I firmly believe medical societies are uniquely positioned to work with physician members on a voluntary basis to build the skills necessary to manage their medical practices effectively. There is wide variability between the individual practices that one might encounter as a patient. The most satisfying and successful practice will capitalize on those aspects which yield a satisfied patient. This must be accomplished without compromising our professional stature nor bending our ethics.

Let's examine the program adopted by the House of Delegates.

There are multiple facets to the MMSC Physicians Marketing Services Program.

1. *Research and Analysis.*

The organization, delivery and financing of health care services is changing rapidly. The preferred provider organization (PPO) concept and prospective reimbursement of hospitals utilizing diagnosis related groups (DRGs) have just become reality during this last year. Assessment of such change will be made available to members through publications (e.g. Minnesota Medicine, MMA Monitor), seminars, and presentations to county societies and hospital medical staffs by MMA leadership. Direct consultation will be made available to individual and groups of physicians upon request.

2. *Data Base.*

We need to develop a definitive source of information concerning physicians in the practice of medicine in Minnesota. The MMSC will become that resource for information which can be useful in improving an individual physician's practice. This will include the development of membership profiles, management profiles, utilization profiles, and fee profiles to the extent the law will allow,

and there will be periodic evaluation of the perceptions of patients concerning the medical profession and the factors which they feel are important in the selection of their physician and/or health care plan. This data will become the foundation of a Physicians Placement Service.

3. *Communications Program.*

Physicians need to tell their side of the story. The quality of American medicine is outstanding. It is time we move from telling the public how to prevent swimmers' itch to explaining the value that their health care dollar can purchase. This program would involve the media and the more personal approach of physicians communicating to whatever group will listen to our side of the story. Physicians are in competition with a wide variety of non-physician health care providers whose ranks are expanding whether we like it or not.

4. *Activities Designed to Assist Physicians to Function in the Competitive Health Care Marketplace.*

From a broad vantage point, the MMSC will provide a variety of products and services in order to improve the physician's competitive position in the marketplace. Several are described in other sections of this review of the resolution. Additionally, the MMSC is in a particularly good position to provide objective, unbiased evaluation of contracts and participation agreements which a physician or group may enter into. Assistance in negotiation of agreements will also be available.

5. *Marketing and Practice Management Services.*

Such service will be made available to individual physicians, medical groups, hospital medical staffs, and others upon request. MMSC will act as a counselor regarding practice patterns and a variety of related topics, including personnel, marketing, promotion, patient surveys, third-party-payor procedures, and other management-related concerns.

Start-up funding for the marketing services program is being provided by the MMA through an allocation of membership dues dollars and possibly from voluntary contributions sought from component medical societies and other interested sources (e.g., specialty societies). The initial commitment of the MMA to this program is \$130,000 during fiscal year 1983-84 and quite possibly a similar amount in fiscal year 1984-85.

As a means of reducing start-up costs to the MMA, the possibility of a "joint venture" with the AMA is being explored. One or more local test sites would provide valuable insight to the AMA in its own efforts to design/refine effective marketing service programs

for physicians.

While many aspects of the marketing services program will be available to all members of the MMA (e.g., assessments of new developments in the health care system, fee profiles and evaluation of health plan contracts offered to physicians), other services will be made available on a fee basis to interested physicians, medical groups, hospital medical staffs and others (e.g., interpretation of practice profiles, the development of marketing and business plans for individual physician offices). It is hoped that revenue generated from products and services sold to physicians will eventually offset to a significant degree the cost associated with maintaining a marketing services program.

Status of Program

The marketing program is now being developed and implemented subsequent to its adoption by the House of Delegates. Recently, a Director of Marketing, Laura Grygar, was hired and she, along with several MMA staff persons, are working earnestly on the project. MMA professional staff now includes attorneys, communications specialists, researchers, persons familiar with health economics and other aspects of our increasingly competitive environment, and a full-time information specialist to coordinate the expansion and development of computerized information systems.

As mentioned previously, the MMA has formed the Minnesota Medical Services Corporation, a for-profit corporation which is wholly owned by the MMA. In addition to components of the marketing

program which have been explained here, the corporation will provide an array of other services and products to MMA members, including insurance and computer products.

One-day Practice Management Seminars were held on October 20-21, 1983, as part of the MMA's mission to keep members abreast of changes in health care and related competitive techniques. The first, "Computers in Private Practice," will be followed by a more advanced course offering in 1984 if interest warrants. The second, "Marketing Strategies for Private Practice," will be presented again in St. Cloud on Wednesday, December 7, 1983, co-sponsored by the MMA and Stearns-Benton County Medical Society. For further information, contact either Laura Grygar, Director of Marketing, or Eugenia Kassir, Director of Continuing Medical Education and Meeting Services.

Summary

Dr. Tom Love, in the *Bulletin of the Ramsey County Medical Society*, stated that "many physicians have reacted to this movement (competition) with feelings of anxiety, paranoia and hostility".⁴ This is the usual reaction of change in any system. After all, inertia is the greatest force governing the activity of virtually all of us. In the same issue, Dr. Phil Roy, Ramsey County Medical Society President stated that marketing must incorporate both talking and listening.⁵ The sensitive listeners will clearly hear the message from their patients. They will enjoy a most successful career in medicine.

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1983 International Directory of Physicians Caring for Youth with Diabetes

Donnell D. Etzwiler, M.D. and Marilyn Pickard

The International Diabetes Center, with the assistance of the International Diabetes Federation has developed an International Directory of Physicians Caring for Youth with Diabetes. There are over 600 physicians listed from 33 nations.

This Directory will be of major benefit to patients and members of their families who are traveling or moving and will be of considerable help to physicians and other health care providers in identifying sources for referral, care and assistance.

The Directory may be purchased for \$5.00 (U.S.) and \$7.00 (Foreign) by mailing your check to the:

International Diabetes Center
4959 Excelsior Boulevard
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Minnesota Medical Services Corporation

Marketing Survey

To Be Conducted

Following guidelines established by the House of Delegates in May, the Minnesota Medical Services Corporation will be conducting an all-member survey by mail in November to determine the need for and interest in marketing services provided by the MMSC.

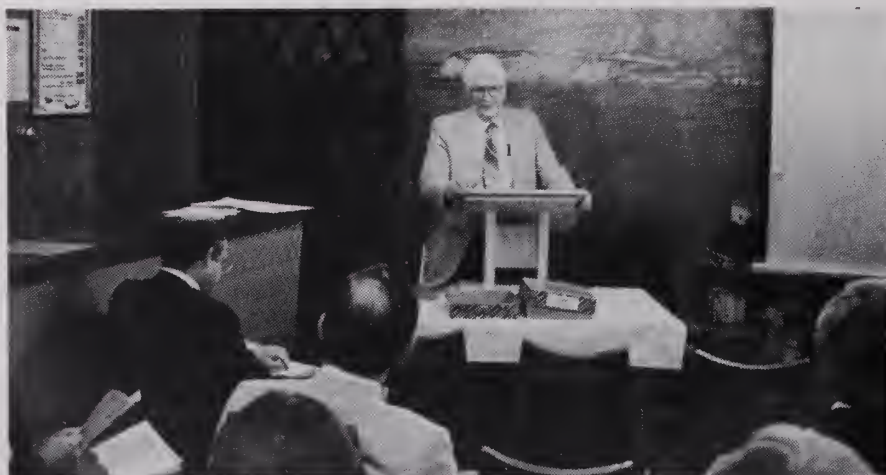
The questionnaire has been designed by Laura Grygar, Director of Marketing, in consultation with Theodore Fredrickson, Ph.D., who is Professor of Marketing at the College of St. Thomas, St. Paul. The survey instrument has been structured to be brief while assembling a large amount of quantitative and qualitative data. Members will find that completion of the 17-question survey should take no more than ten minutes.

"This is an important initial step in the marketing program," said Thomas Briggs, M.D., Chairman of the Marketing Task Force and member of the MMSC Board of Trustees. "It's important that we get a picture of members' priorities for the corporation at this stage since we have a long list of agenda items which will have to be carefully administered in the next few years. It will be helpful to know the membership's priorities."

The survey includes a list of twenty-five services and products and twelve seminars which have been initially identified as possible offerings according to Grygar. "We're also interested in receiving input from members about particular needs that are not on the list," said Grygar. "The membership represents a highly diverse set of experiences, and we anticipate meaningful suggestions that will benefit individual and group practice physicians alike."

James Knapp, M.D., MMSC Chairman of the Board, stresses the importance of each member taking time to respond to the questionnaire. "We have kept it short to minimize the tendency to bury it in the paperwork mill," said Knapp. "And we've sent it by bulk mail, thus cutting the cost of the survey by one-fourth. Please alert your ancillary personnel to watch for this important piece of mail when it arrives in early November. To a large extent, the success of our first year depends on each member responding to this survey."

A business reply envelope will be included with the survey to expedite return. Each survey will carry a number which indicates county medical society affiliation while preserving the respondent's confidentiality.



Dr. Donald C. Bell, MMA president, addresses the Southwestern Medical Society at Worthington, September 12. (Photo by Roger Johnson)

A New Reimbursement System

The DRGs are Coming

CAROL J. KAEMMERER

Director of Research

What Are DRGs?

DRGs (diagnosis related groups) is a system for sorting patients by discharge diagnosis into categories that are medically similar and have approximately equivalent lengths of stay. The DRG concept, which was originally developed by researchers at Yale University in the 1970's, has now been refined to include 467 diagnostic categories. DRGs can be used as a management tool, to assess quality of care, or as a payment system.

In the 1983 Amendments to the Social Security Act (P.L. 98-21), Congress acted to establish a prospective payment

system for Medicare payments to hospitals based on DRGs. Under this system, the Medicare payment will be based on DRG classification utilizing discharge diagnosis. The payment to the hospital will be the same predetermined, fixed amount for each DRG, regardless of the length of stay or resources used.

Medicare payments by DRGs will be phased in over three years beginning with the hospital's first cost reporting period after October 1, 1983.

How Will DRGs Affect Your Practice?

Initially, DRGs will be the method used for Medicare payment for inpatient hospital services billed by the hospital only. However, the Department of Health and Human Services is to report in 1985 on the "advisability and feasibility" of applying DRGs to physician charges for hospital services and, if appropriate, to recommend legislation to implement this change.

Although DRGs will initially cover only hospital charges, that does not mean you and your patients will not be affected.

Since hospitals will be paid a set amount per discharge diagnosis regardless of the resources utilized by a particular patient, the hospital will have a significant incentive to pressure you to utilize resources equivalent to or less than the amount the hospital receives for its DRG payment per patient. Because DRGs contain no measure of the severity of illness, the elimination of payment differentials could result in a reduction in access and quality of care to more severely ill patients.

For your hospital to remain financially viable, costs must be managed within the limits of available revenues. It is anticipated that hospitals will collect data on each physician by DRG to track the "high utilizers." Physicians who continue a pattern of high utilization under this system place

their hospitals—and ultimately themselves—in jeopardy of significant financial loss. Hospitals will favor physicians who they interpret to be efficient utilizers of medical care resources.

In addition, since payment is based on discharge diagnosis, physicians will be expected to complete their discharge summary in a comprehensive and timely manner. To facilitate the assigning of a patient to a DRG for payment purposes, the physician must record the principal diagnosis, any secondary diagnoses, and all surgical procedures performed.

Traditionally, Medicare has not paid its fair share of hospital costs generated by its patients, causing a cost-shift to other payor groups. Since the amount paid out by Medicare will not be higher than under the previous system, this situation is not expected to improve. As other third party payors experience the shift of costs from Medicare, they may also choose to change their payment systems to DRGs as well. Blue Cross/Blue Shield of Kansas has already opted for this method, and the Blue Cross/Blue Shield Associations in many other states are considering this option.

What Are Some of The Major Features Of The DRG Legislation?

The DRG prospective payment plan for Medicare, enacted as part of the Social Security Amendments of 1983, continues the movement away from retrospective cost-based reimbursement. Prospective payment, by changing hospital incentives, is a step toward the desired long-term financial stability of the Medicare Program and allows hospitals to benefit financially from improvements in management.

Some of the major elements of the legislation are:

- Applies to Medicare in-patient costs billed by the hospital only;
- Excludes long-term, psychiatric, rehabilitation and children's hospitals (or such distinct units within general hospitals);
- Excludes hospitals and states with approved cost control systems;
- Includes special adjustments for hospitals designated as sole community providers, as well as cancer research and

regional or national referral hospitals;

- Includes full incentive payments for hospitals (hospitals may keep the difference if they deliver services for less than the DRG rate);
- Prohibits hospitals from charging beneficiaries for any difference between DRG reimbursement and actual costs;
- Provides additional payments for a small number of atypically long-stay cases;
- Reimburses capital and medical education expenses on a reasonable cost basis;
- Provides for an annual adjustment in DRG rates, and a reassessment of the structure of the system every 4 years; and
- Stipulates that, by October 1, 1984, hospitals must have a contract with a Peer Review Organization (PRO) as a condition for Medicare payment.

DRG Pros and Cons

Patients

- | Pros | Cons |
|---|---|
| 1) Hospitals may emphasize their discharge planning and alternative care programs to ease early discharge arrangements. | 1) If hospitals lose money on Medicare patients or in specific DRG categories, they may seek to cut the number of admissions for that type of patient. |
| 2) Patients will not be charged the difference between DRG payment and actual hospital costs. | 2) Sicker, more costly patients within a DRG may be transferred from a private hospital to a public hospital that is obligated by law to accept all patients. |
| 3) Under a prospective payment system, Medicare has improved chances of survival. | 3) Patients may be discharged earlier than is medically advisable and be denied helpful tests. |
| | 4) The system may result in shifting Medicare costs to the private sector. |

Physicians

- | Pros | Cons |
|---|---|
| 1) Since outpatient services are not subject to the DRG payments, there may be incentives to perform more procedures in physicians' offices. | 1) The system puts physicians in a position of conflict between the interests of their patients and financial considerations of the hospital. |
| 2) Physicians will learn more about their own practice style through comparison with others. | 2) Some physicians who are "high utilizers" may lose their staff privileges unless they modify their style of practice. |
| 3) Physicians will have the opportunity to demonstrate their leadership by initiating dialogue with hospital administrators and trustees to assure that the quality of patient care is preserved. | 3) The system may be extended to physicians' services in the future. |
| | 4) Physicians may be asked to choose, among several appropriate diagnoses, the one which will be the most remunerative for the hospital. |
| | 5) Physicians may antagonize patients over seemingly minor issues in efforts to contain costs. Patients may be displeased enough to seek a new physician. |

Hospitals

- | Pros | Cons |
|--|--|
| 1) Hospitals which operate efficiently and provide care at less cost than the DRG payment can "pocket" the difference. | 1) The government may continue to reduce the payment over time as hospitals improve their efficiency. |
| 2) Hospitals will have a good data base from which to make management decisions. | 2) Hospitals which are not able to provide care at the cost of the DRG payment may lose money when they treat Medicare patients. |
| | 3) Hospitals will know in advance of the service delivery how much will be paid for services provided for each patient. |
| | 3) The system creates an incentive to upgrade the severity of the discharge diagnosis— "DRG creep". |

How Will DRGs Be Phased-In?

In the **FIRST YEAR**, the Medicare payment per discharge will be:

- 25% of the regional DRG rate (Minnesota will be grouped with states in the West North Central Census Region: ND, SD, NE, MO, IA, MN); plus

- 75% of the hospital-specific rate.

In the **SECOND YEAR**, payment per discharge will be:

- 50% of a combination of national and regional DRG rates* (25% national, 75% regional); plus

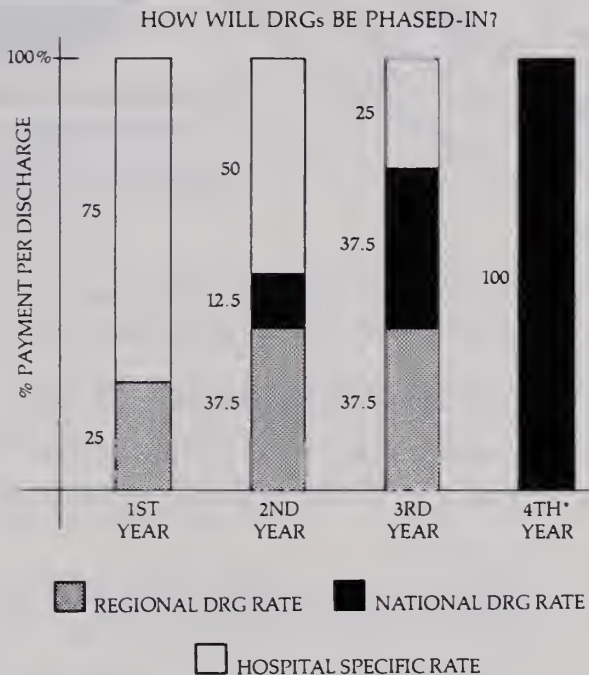
- 50% of the hospital-specific rate.

In the **THIRD AND LAST PHASE-IN YEAR**, the payment per discharge will be:

- 75% of a combination of national and regional rates (50% national, 50% regional); plus

- 25% of the hospital-specific rate.

EFFECTIVE OCTOBER 1, 1986, Medicare payment will be 100% of the national DRG rate for each discharge, with regional adjustments for labor costs.



* With regional adjustments for labor costs.

How Can Medical Staffs Adjust To The Change?

In the interests of quality patient care, medical staffs should take a leadership role in requesting an ongoing dialogue with hospital administration and trustees. Forums to discuss some of the possible adverse impacts on patient care, and to develop some collective strategies to deal with this, will be most helpful. In addition, physicians should work actively with those committees established for reviewing costs and developing protocols to propose medically appropriate and responsible cost containment strategies which do not

adversely affect quality of care, and to reject those suggestions which would have a negative impact on patient care.

DRGs ARE the law of the land for Medicare hospital payments, and may, in the future, be the law of the land for physician payments as well. The change in the reimbursement system from per diem to per discharge rates will have significant ramifications. The best advice is to use your energies wisely to learn how the new system works and how you can best practice within the system.

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DRGs and PPS — A Glossary

CAROL J. KAEMMERER

Director of Research

Is your hospital administrator beginning to speak unintelligible ALPHABET SOUP? — DRGs, PPS, PROs . . . ? The Prospective Payment System for Medicare, mandated as a part of the Social Security Amendments of 1983, involves a new set of acronyms and terms that can mystify even the finest clinician. This glossary should help you sort out the new jargon.

- Budget Neutrality:** A term expressing the policy decision that the total amount of federal expenditures under prospective payment in FY '84 and '85 will be *the same* as estimated under the cost reimbursement system.
- Cancer Research Hospital:** A hospital whose primary mission is restricted to cancer care. The majority of the cases treated by the hospital must be cancer cases, and the hospital must have a substantial commitment to research on cancer. Hospitals which meet this criteria will have the opportunity to opt for reimbursement on a reasonable cost basis subject to the target rate ceiling.
- CC (Complication and/or Co-Morbidity):** Complications and co-morbidity conditions affecting the patient often increase the resource intensity needed for treatment, and therefore affect the DRG number. See also "Substantial Co-Morbidity" and "Substantial Complication".
- Cost Outliers:** Cases which involve unusually high costs, and are recognized as such only if they are not eligible for payment as day outliers. They are cases where payment can be made beyond the prospective payment rate because extraordinary costs are incurred in a short period of time in treating the patient. Hospitals must specifically request cost outlier payment.
- Cost Reporting Period:** The hospital's own accounting year which may begin at any time during the calendar year.
- Day Outlier:** Cases involving unusually long stays which result in per diem payments beyond the DRG rate for each day exceeding a specified number of days (i.e., for each day exceeding the day outlier threshold criteria for the DRG on which covered care is provided). The determination of eligibility for extra Medicare payment is "automatic" for outlier days.
- Department of Health and Human Services (HHS):** The federal department responsible for health care activity including Medicare and Medicaid.
- Diagnosis Related Groups (DRGs):** A patient classification scheme whose patient types are defined by patients' diagnoses or procedures, and in some (but not all) cases, patients' age or discharge status. Each of the 467 DRGs, or discharge classifications, is intended to be "medically meaningful" and would ordinarily require approximately equal resource consumption as measured by length of stay and cost. Under the new Prospective Payment System, Medicare has assigned each DRG a specific reimbursement rate. (See also "Exclusion Groups.")
- Discharge:** A patient is considered to be discharged when: the patient is formally released from the hospital; the patient dies in the hospital; or the patient is transferred

to a hospital or unit that is *excluded* from the Prospective Payment System. When a patient is released from one hospital into the care of another, that patient is considered to be *transferred* rather than discharged.

- DRG:** See "Diagnosis Related Groups".
- DRG Creep:** The artificial inflating of diagnoses to obtain higher payment for the hospital.
- DRG Decision Tree:** A diagram which identifies the process by which a patient is assigned to a DRG.
- DRG Weighting Factors:** Weighting factors for each DRG that are intended to reflect the relative resource consumption associated with that DRG.
- Excluded Costs:** The following inpatient hospital costs are excluded from prospective payment amounts and paid for on a reasonable cost basis: capital related costs; direct medical education costs; costs for direct medical and surgical services of physicians in teaching hospitals; kidney acquisition costs incurred by a certified renal transplant center.
- Exclusion Groups:** Three groups developed to accommodate patients who are not assigned to one of the 467 DRGs.
 468 — Unrelated operating room procedure to a given major diagnostic category.
 469 — Valid diagnosis, but not as a principal diagnosis.
 470 — Invalid code, based on age, sex, diagnosis, E-code, discharge status; the record does not meet the criteria for any DRG MDC indicated by the principal diagnosis, etc.
- Fiscal Year (FY):** The federal budget year beginning October 1st prior to the calendar year. For example, fiscal year (FY) 1984 begins October 1, 1983 and ends September 30, 1984.
- Gaming:** Manipulation of the DRG/PPS system, such as having multiple admissions for the same patient for the same illness, or unnecessarily transferring a patient to multiple hospitals to maximize payment to each. The Peer Review Organizations have been charged by law to monitor such practices.
- Grouper:** The name of the software used for computerized assignment of the ICD-9-CM codes into 470 DRGs (467 medically meaningful classifications and 3 exclusion groups).
- HBP:** See "Hospital-Based Physician".
- HCFA:** See "Health Care Financing Administration".
- Health Care Financing Administration (HCFA):** The federal agency charged with administration of the Medicare and Medicaid programs under the auspices of the Department of Health and Human Services. (See also "Department of Health and Human Services" and "HHS".)
- HHS:** See "Department of Health and Human Services".
- Hospital-Based Physician (HBP):** A physician whose practice is almost entirely hospital patients and whose compensation is normally received from or through the hospital. Part of the compensation received is usually for administration of one or more of the hospital's ancillary departments. Common HBP specialties include pathology, radiology and anesthesiology. (Also referred to as "Provider-Based Physician" or "PBP".)

<u>ICD-9-CM:</u>	Stands for International Classification of Diseases, 9th Revision, Clinical Modifications. A system for classifying diseases and operations according to the problems they present for the purpose of indexing hospital records. The ICD-9-CM codes serve as the basis for the DRGs that will be used under Medicare prospective pricing.
<u>Inlier:</u>	Those patients whose resource utilization for their assigned DRG lies within the established trim points.
<u>Length Of Stay (LOS):</u>	The length of an inpatient's stay in a hospital, reported as the number of days spent in a facility per admission or discharge.
<u>LOS:</u>	See "Length of Stay".
<u>Major Diagnostic Category (MDC):</u>	One of the 23 subdivisions to which all the ICD-9-CM codes have been assigned on the basis of an organ system, whenever possible.
<u>MDC:</u>	See "Major Diagnostic Category".
<u>Medical Meaningfulness:</u>	Patients in the same DRG can be expected to evoke a set of clinical responses which result in a similar pattern of resource use.
<u>Medicare Provider Analysis Review File (MEDPAR File):</u>	A file of data collected nationally by the Health Care Financing Administration from a 20% sample of bills for Medicare beneficiaries discharged from short-stay hospitals. The file contains billed charge data and clinical characteristics, and forms the basis for the Medicare Casemix Index.
<u>MEDPAR File:</u>	See "Medicare Provider Analysis Review File".
<u>Other Diagnoses:</u>	All conditions that co-exist at the time of admission, or develop subsequently, which affect the treatment received and/or the length of stay. Diagnoses that relate to an earlier episode which have no bearing on the hospital stay are to be excluded.
<u>Outliers:</u>	Those cases that are unusually expensive and will receive additional payments above the DRG level. Literally, they "lie outside" the normal distribution of medical cases. Outliers are classified as either "day outliers" or "cost outliers". Outlier payments may not exceed 6% of the total payment projected to be made based on the prospective payment rates in any year. (See also "Inlier," "Day Outlier," "Cost Outlier.")
<u>Peer Review Organization (PRO):</u>	The utilization and quality control reviewing unit which is the successor to the Professional Standards Review Organization (PSRO). By law, PROs are mandated to review: the validity of diagnostic information; the completeness, adequacy and quality of care provided; the appropriateness of admissions and discharges; and the appropriateness of services provided under Medicare Part A. All hospitals must contract with a PRO by October 1, 1984 as a condition for receiving payments under the Medicare program.
<u>Per-Case Reimbursement:</u>	Reimbursement for medical care on the basis of each case rather than the traditional fee-for-service approach.
<u>PPS:</u>	See "Prospective Payment System".
<u>Principal Diagnosis:</u>	That condition which, after study, is determined to be the reason for admission to the hospital.
<u>Principal Procedure:</u>	In determining which of several procedures is the principal one, the following criteria apply:

- a) The principal procedure is the one which was performed for definitive treatment, rather than one performed for diagnostic or exploratory purposes or necessary to treat a complication.
- b) The principal procedure is that procedure *most related* to the principal diagnosis.

<u>PRO:</u>	See "Peer Review Organization".
<u>Prospective Payment System (PPS):</u>	The system set forth in the 1983 Amendments to the Social Security Act (P.L. 98-21) for Medicare payments for hospital inpatient services based on DRGs. The payment to the hospital will be the same pre-determined, fixed amount for each DRG, regardless of the length of stay or resources used.
<u>Referral Centers:</u>	A hospital located in a rural area with at least 500 beds, or a hospital which has a patient population such that at least 60% of all Medicare patients reside out-of-state or more than 100 miles from the hospital (whichever is more stringent); and at least 60% of all services received by Medicare beneficiaries must be provided to Medicare beneficiaries residing out-of-state or more than 100 miles from the hospital.
<u>Retrospective Cost-Based Reimbursement:</u>	The method of payment currently used by the Medicare program for paying providers for services rendered to beneficiaries on the basis of "reasonable costs" incurred in the provision of those services.
<u>SCH:</u>	See "Sole Community Hospital".
<u>Sole Community Hospital (SCH):</u>	Those hospitals which are the sole source of inpatient hospital services reasonably available to individuals in a geographic area as influenced by factors such as isolated location, weather conditions, travel conditions, or absence of other hospitals. A special payment formula will be used for hospitals so classified. (Also referred to as "Sole Community Provider".)
<u>Substantial Co-Morbidity:</u>	A pre-existing condition that will, because of its presence with a specific principal diagnosis, cause an increase in length of stay by at least one day in approximately 75% of the cases.
<u>Substantial Complication:</u>	A condition that arises during the hospital stay that prolongs the length of stay by at least one day in approximately 75% of the cases.
<u>Tax Equity and Fiscal Responsibility Act (TEFRA):</u>	Legislation enacted in 1982 which placed limits on reimbursement for total hospital operating costs per case, and on reimbursable hospital costs overall. Prospective payment supersedes TEFRA limits, but provides the same level of Medicare savings for FY '84 and '85.
<u>TEFRA:</u>	See "Tax Equity & Fiscal Responsibility Act".
<u>Transition Period:</u>	The three year period beginning October 1, 1983 during which the Prospective Payment System will be phased in.
<u>Trim Points:</u>	A length-of-stay parameter, i.e. a minimum and maximum number of days, per admission, for a given DRG.

Interspecialty Council Highlights

Current Activities of the Interspecialty Council

DRGs

The DRG (Diagnosis Related Groups) prospective payment system for Medicare payments to hospitals will require physicians to be a driving force to pull this system together, working closely with the trustees of their hospitals and their hospital administration. Coordination between physicians, social service personnel and medical records people will be essential, because the practice style of each physician will be closely monitored by the hospital. The quality of patient care, the viability of the hospital, and the physician's position on the medical staff are all at stake.

In October, 1985 a report to Congress will discuss the reasonableness and feasibility of paying for physician services on the basis of DRGs. The consensus of experts in the area of DRGs is convinced the system will incorporate physicians at some future time (sooner rather than later).

Quality of care is definitely under attack. Each group (physician, hospital trustee, hospital administration) must work together to maintain the quality of patient care.

Currently being planned is a half day workshop jointly sponsored by MMA and the Minnesota Hospital Association for physicians, trustees, and administrators called "Preparing for DRGs".

Three video tapes produced by the Minnesota Hospital Association have been purchased by the MMA. The Interspecialty Council will make these tapes available to all specialty societies to assist the specialties in informing their members of the DRG system. Part I on the video tapes is entitled "Overview of the Prospective Payment System"; Part II, "Adapting to the DRG Challenge; Part III "Clinician and Behavior and Hospital Performance". The video tapes feature Dr. Warren B. Nestler, Vice-President and Director of Quality Assurance at Overlook Hospital in Summit, New Jersey.

Contact Linda Lacher at the MMA office if your specialty society would like to view these tapes.

Permanent/Partial Disability Guidelines

The permanent/partial guidelines are a product of the 1983 Workers Compensation Bill passed by the Legislature. The physicians and staff of the MMA have expended a great deal of effort providing technical assistance to the Commissioner of Labor and Industry to develop these guidelines. The legislation

requires the Commissioner of Labor to have in place a standardized rating system for all Workers Comp permanent/partial disability by January 1, 1984.

The Guidelines are needed to eliminate the differences in physician testimony on the percentage of disability which has resulted in court determinations at the higher percentages. The guidelines will allow a predetermined percentage of disability based on a physician's diagnosis. MMA staff have worked with small groups of specialists to develop the correct technical details for the rule. The rule was published in the State Register on October 3, 1983. The guidelines will serve as a working tool for physicians in cases of workers compensation.

Legislative Contact Program

The Legislative Contact Program was a direct offshoot of the 1983 legislative session. It became very apparent after the legislative session that the MMA members did not feel well enough informed on the issues, and the Board of Trustees and various policy committees felt uncomfortable with the complexity of the issues of importance to the MMA. It was decided to reassess the procedure for internally handling the regulatory and legislative program and better train the physicians of MMA to handle the system. An aggressive program to educate and inform physicians was developed. The focus of the program is to keep the members informed on the issues and to feel comfortable with their legislative contacts.

Medicine has traditionally been a well respected, well received lobbying group. However, members need to know that their voice is heard and respected. This requires more involvement and more physician contact with legislators to preserve our leadership role.

Implementation of the legislative contact program will be an aggressive campaign to educate Association leaders (MMA delegates, trustees, committee members) and will include components to explain Association legislative priorities, to explain how periodic communication should occur with legislators and to inform Association leaders of member resources within each legislative district.

When an issue involves one specialty but not others, the issue will be brought to the ISC to inform and involve all other specialties in the lobbying process. By having all sources converge on the issue, we will supply the kind of input needed for a sensitive

INTERSPECIALTY COUNCIL HIGHLIGHTS

issue.

To have a well run, organized system all issues must go through the MMA Committee on Legislation to determine the position of political appropriateness, to establish coalitions if necessary, to put a priority on the issue, and to make a recommendation to the Board of Trustees.

The ISC is very supportive of the legislative program of the MMA and through the specialty societies, will help establish key contact people through which the Legislative Committee can work.

Marketing Program

The new Marketing Program will offer new and diverse services and products to physicians in a creative way targeted to specialty societies as well as individual physicians, to maximize the medical communities impact on the public's perception of quality health care. The marketing strategy needs to tell the Dr.'s side of the story to the public.

A survey will be forthcoming to determine the needs of the physicians, whether it is consulting or a

specific seminar, or practice management problems, or any other suggestions that would lead to a workable marketing program. The results will be provided to all members to enable each physician to view his/her practice in light of other physicians.

Board of Medical Examiners Vacancy

The ISC Steering Committee recommended to the full Interspecialty Council and the Board of Trustees, the following names for the vacancy on the Board of Medical Examiners: Dr. Cassius Ellis, Surgeon, Minneapolis; Dr. Thomas Love, Urologist, St. Paul; Dr. Edward Kelly, Orthopedic Surgeon, St. Paul; and Dr. Janice Ophoven, Pathologist, St. Paul. The vacancy occurs when Dr. Loren Nelson of St. Paul leaves that position 12/31. The recommendations were forwarded to the Governor.

The Interspecialty Council greatly appreciates the interest shown by so many worthy physicians. To limit the recommendations to four names was indeed difficult.

If you have any questions concerning the above, please contact your Interspecialty Council representative.

Interspecialty Council Representatives

MN Allergy Society
William Schoenwetter, M.D., 612/927-3091

MN Society of Anesthesiologists
Russell H. Larsen, M.D., 612/373-8826

MN Dermatologic Society
John Stansbury, M.D., 612/339-3095

MN Chapter, American College of Emergency Physicians
James R. Bishop, M.D., 612/924-5000

MN Academy of Family Physicians
John Sutherland, M.D., 507/284-2511

MN Component, American Society of Internal Medicine
Lowell Weber, M.D., 612/333-8883

MN Society of Internal Medicine
Robert Lindell, M.D., (612) 298-8000

MN Chapter, American College of Physicians
James H. Kelly, M.D., 612/252-5131

MN Neurosurgical Society
Burton Onofrio, M.D., 507/284-2611

MN Society of Neurological Sciences
John Gates, M.D., 612/221-3700

Association of Neurologists of Minnesota
Lawrence Schut, M.D., 612/588-0661

MN Obstetrical and Gynecological Society
M. Ismail Barrada, M.D., 612/298-8414

North Central Occupational Medical Association
Frank Ubel, M.D., 612/733-5181

MN Academy of Ophthalmology & Otolaryngology
Ekrem Gozum, M.D., 612/920-4595 — OTO
James Trautmann, M.D., 507/284-2511 — OPH

MN Association of Ophthalmology
Raymond Croissant, M.D., 612/927-7138

Minnesota State Orthopedic Society
Joseph Zeleny, M.D., 612/251-4170

MN Society of Clinical Pathologists
Richard W. Anderson, M.D., 612/221-1719

MN Chapter, American Academy of Pediatrics
Lowell W. Barr, M.D., 507/373-1441

MN Physiatrie Society
Herbert Schoening, M.D., (612) 338-2229

MN Society of Plastic Surgeons
William Carter, M.D., 612/925-1765

MN Psychiatric Society
M. J. Martin, M.D., 507/284-2933

MN Radiological Society
William Chandler, M.D., 612/927-4689

MN Chapter, American College of Surgeons
John Culligan, M.D., 612/227-7564

MN Surgical Society
John Sanford, M.D., 218/722-8364

MN Thoracic Society
F. L. Rasp, M.D., 612/333-2156

MN Urological Society
Thomas Love, M.D., 612/224-7543

Robert Christensen, M.D., Chairman, Interspecialty Council
612/445-1305

Minnesota Medical Association

CME in Minnesota

Provided through the Medical Education Subcommittee on CME Resources

For assistance with scheduling meetings, please contact the MMA office (address and phone given below) for information on future medical meetings and CME courses at the state and national level.

Information for each entry is arranged as follows: Date: Name of program; Primary sponsor; Location; Contact person.

November, 1983

3 John I. Coe Symposium — Computers in Anatomic Pathology and Newer Immunodiagnostic Techniques; U of M; Hennepin County Medical Center; CONTACT: John T. Crosson, M.D., 701 Park Avenue, Minneapolis, MN 55447; 612/347/3010

3-4 Society of Shoulder & Elbow Surgeons; Mayo Clinic, Rochester; Postgraduate Courses, Mayo Clinic, 200 1st Street S.W., Rochester, MN 55905; 507/284-2085.

4 Head & Neck Pathology — E. T. Bell Annual Pathology Symposium; U of M, Minneapolis; CONTACT: CME, U of M, Box 293 Mayo Memorial Building, 420 Delaware St. S.E., Minneapolis, MN 55455; 612/373-8012.

4 Semi-Annual Meeting, MN Surgical Society; Minneapolis, MN; CONTACT: Charles L. Barbee, M.D., 1000 E. 1st St., Ste. 203, Duluth, MN 55805; 218/727-7259.

5 Fall Seminar — Minnesota Society of Clinical Pathologists; Phillips Wangenstein, University of Minnesota; CONTACT: Eugenia Kassar, 2221 University Avenue, S.E., Suite 400, Minneapolis, MN 55414; 612/378-1875.

5 Minnesota Society of Anesthesiologists — Fall Meeting; L'hotel Sofitel, Minneapolis; CONTACT: David E. Byer, M.D., 200 1st Street S.W., Rochester, MN 55901.

6 ENT for Primary Care Physicians; Mayo Clinic Rochester; CONTACT: Postgraduate Courses, Mayo Clinic, 200 1st Street, S.W., Rochester, MN 55905 507/284-2085.

7 Problems in OB/GYN and Endocrinology; The Duluth Clinic; St. Mary's Hospital Auditorium; CONTACT: James Brueggemann, M.D., The Duluth Clinic, Ltd., 400 E. 3rd Street, Duluth, MN 55805; 218/722-8364.

7-9 Clinical Reviews; Mayo Clinic Rochester; CONTACT: Postgraduate Courses, Mayo Clinic, 200 1st Street, S.W., Rochester, MN 55905; 507/284-2085.

9-10 Behavioral Medicine; University of Minnesota; Mayo Memorial Auditorium, U of M; CONTACT: CME, U of M, Box 293 Mayo Memorial Building, 420 Delaware Street S.E., Minneapolis, MN 55455; 612/373-8012.

10-12 Clinical Strategies in Primary Care Medicine; St. Paul-Ramsey Medical Center & University of Minnesota Medical School; The Saint Paul Hotel; CONTACT: Ruth McIntyre, 640 Jackson Street, St. Paul, MN 55101; 612/221-3992.

11 Joint SPRMC Medical Staff Meeting and Research Conference; St. Paul-Ramsey Medical Center; Radisson Plaza; CONTACT: Ruth McIntyre, 640 Jackson Street, St. Paul, MN 55101; 612/221-3992.

11 Problems in Gynecology and Endocrinology; The Duluth Clinic Ltd.; St. Mary's Hospital Auditorium; CONTACT: J. G. Brueggemann, M.D., The Duluth Clinic Ltd., 400 East 3rd Street, Duluth, MN 55805; 218/722-8364.

11-12 4th Annual Seminar for CME Directors; Minnesota Medical Association; Spring Hill Center, Wayzata; CONTACT: Eugenia C. Kassar, Suite 400, 2221 University Avenue S.E., Minneapolis, MN 55414; 612/378-1875.

12 Challenge of Prevention: Health Promotion for Children and Youth; University of Minnesota Extension Classes; 33 McNeal Hall, St. Paul Campus; CONTACT: Cyndy Brinkman, 202 Westbrook Hall, 77 Pleasant Street S.E., Minneapolis, MN 55455; 612/373-3039.

16 Metabolism (Diabetes); Central Mesabi Medical Center; Multipurpose rooms, CMMC; CONTACT: Ben P. Owens, M.D., Mesaba Clinic, Hibbing, MN 55746; 218/262-3441.

17 Education in Preventive Oncology; University of Minnesota Medical School, CME; Sheraton-Ritz Hotel; CONTACT: Bart W. Galle, Ph.D., Interim Director, University of Minnesota; 612/373-8012.

19-20 Endourology: Percutaneous Access to Urinary Tract; University of Minnesota Medical School, CME; Moos Health Sciences Tower, U of M; CONTACT: Bart Galle, Ph.D., Interim Director, CME U of M, Box 293 Mayo Memorial Building, 420 Delaware Street S.E., Minneapolis, MN 55455; 612/373-8012.

27-29 Coronary Heart Disease Workshop; University of Minnesota; Spring Hill Center, Wayzata; CONTACT: CME, University of Minnesota, Box 293 Mayo Memorial Building, 420 Delaware Street S.E., Minneapolis, MN 55455; 612/373-8012.

28-29 Basic Life Support Course; Methodist Hospital; Methodist Hospital; CONTACT: Janell Haugen, Methodist Hospital, 6500 Excelsior Boulevard, P.O. Box 650, Minneapolis, MN 55440; 612/932-5189.

29-30 & December 1

Advanced Cardiac Life Support Course; North Memorial Medical Center; NMMC; CONTACT: William Nelson, 3300 Oakdale North, Robbinsdale, MN 55422; 612/520-5200.

Nov. 30-Dec. 1 Family Violence in the Deaf Community; St. Paul-Ramsey Medical Center & Gallaudet College, Washington, D.C.; Sheraton Midway Hotel; CONTACT: Ruth McIntyre, 640 Jackson Street, St. Paul, MN 55101; 612/221-3992.

December, 1983

1-2 Critical Pediatrics; St. Louis Park Medical Center Research Foundation; Bloomington Marriott; CONTACT: Elaine Anderson, Assistant Director of Medical Education, 5000 West 39th Street, Minneapolis, MN 55416; 612/927-3703.

2 Neonatal Resuscitation; North Memorial Medical Center; NMMC; CONTACT: Martin Weems, M.D., 3300 Oakdale North, Robbinsdale, MN 55422; 612/520-5200.

3 Frontiers in Medicine; St. Joseph's Hospital, St. Paul-Ramsey Medical Center & U of M Medical School; St. Joseph's Hospital; CONTACT: Charles Drage, M.D., 69 West Exchange, St. Paul, MN 55102; 612/291-3180.

7-10 Coronary Heart Disease; A Comprehensive Review of Principles and Practice; St. Paul-Ramsey Medical Center & U of M Medical School; Sheraton Midway Hotel; CONTACT: Ruth McIntyre, 640 Jackson Street, St. Paul, MN 55101; 612/221-3992.

January, 1984

7-11 Clinical Electrodiagnosis; Mayo Clinic/Mayo Foundation; Mayo Clinic, Rochester; CONTACT: William L. Nietz, Mayo Clinic, 200 First Street S.W., Rochester, MN 55905; 507/284-2085.

18-20 Telmark Cancer Conference; The Duluth Clinic, Ltd. & Marshfield Clinic; Telemark Lodge; CONTACT: James G. Brueggemann, M.D., The Duluth Clinic, Ltd., 400 East 3rd Street, Duluth, MN 55805; 218/722-8364.

27-28 New Drugs; St. Louis Park Medical Center Research Foundation; Sheraton Park Place Hotel; CONTACT: Elaine Anderson, Assistant Director of Medical Education, 5000 West 39th Street, Minneapolis, MN 55416; 612/927-3703.

February, 1984

3 Surgical Care of Skin Cancer; MN Dermatological Society; Hennepin County Medical Center; CONTACT: J. D. Vance, M.D., 701 Park Avenue S., Minneapolis, MN 55415; 612/347-2332.

4-21 1984 Winter Sportsmedicine Conference; North Central Medical Conference; Sarajevo/Dubrovnik, Yugoslavia; CONTACT: Harold Brunn, North Central Medical Conference, 2221 University Avenue S.E., Suite 400, Minneapolis, MN 55414; 612/378-1875.

8-9 Drug Therapy Symposium; University of Minnesota; Radisson, St. Paul; CONTACT: CME, U of M, Box 293 Mayo Memorial Building, 420 Delaware Street, S.E., Minneapolis, MN 55455; 612/373-8012.

8-10 Training Workshop in Pulmonary Function Testing; St. Paul-Ramsey Medical Center, St. Paul-Ramsey Medical Center; CONTACT: Ruth McIntyre, 640 Jackson Street, St. Paul, MN 55101; 612/221-3992.

15-18 Recent Advances in Coronary Artery Disease; Mayo Clinic/Mayo Foundation; Maui Marriott Resort, Maui, Hawaii; CONTACT: William L. Nietz, Mayo Clinic, 200 First Street, S.W., Rochester, MN 55905; 507/284-2085.

16-17 Current Concepts in Perinatal Medicine; St. Paul-Ramsey Medical Center & U of M Medical School; Radisson Plaza Hotel; CONTACT: Ruth McIntyre, 640 Jackson Street, St. Paul, MN 55101; 612/221-3992.

24-25 ENT Problems in Primary Care; University of Minnesota Medical School; Sheraton Ritz Hotel, Minneapolis; CONTACT: Bart W. Galle, Ph.D., Interim Director, U of M CME, Box 293, Mayo Memorial Building, 420 Delaware Street S.E., Minneapolis, MN 55455; 612/373-8012.

March, 1984

2-3 Family Practice Update; St. Joseph's Hospital; St. Joseph's Hospital; CONTACT: Charles Drage, M.D., 69 West Exchange, St. Paul, MN 55102; 612/291-3180.

3-10 St. John's Hospital Winter Seminar, "Current Concepts of Medicine"; Ramsey County Chapter of the MN Academy of Family Physicians & St. John's Hospital; Vail Village Inn, Vail, Colorado; CONTACT: Mrs. R. J. Sells, 2040 E. Kenwood Drive, St. Paul, MN 55117; 612/776-2110.

8-10 Current Concepts in Cardiopulmonary Medicine; St. Paul-Ramsey Medical Center & U of M Medical School; Radisson Plaza Hotel; CONTACT: Ruth McIntyre, 640 Jackson Street, St. Paul, MN 55101; 612/221-3992.

9-10 Colon and Rectal Diseases; U of M Medical School; Hyatt Regency Hotel; CONTACT: CME, University of Minnesota, Box 293 Mayo Memorial Building, 420 Delaware Street, S.E., Minneapolis, MN; 612/373-8012.

10 Occupational and Environmental Pulmonary Diseases; St. Paul-Ramsey Medical Center & Midwest Center for Occupational Health & Safety & University of Minnesota Medical School; Radisson Plaza, St. Paul; CONTACT: Ruth McIntyre, 640 Jackson Street, St. Paul, MN 55101; 612/221-3992.

12-14 MN Academy of Family Physicians, Spring Refresher; MN Academy of Family Physicians; AMFAC, Minneapolis; CONTACT: Chari Konerza, Executive Director, MN Academy of Family Physicians, Health Associations Center, 2221 University Avenue S.E., Suite 426, Minneapolis, MN 55414; 612/623-9559.

23-24 Obstetrics Update; St. Paul-Ramsey Medical Center & U of M Medical School, The Saint Paul Hotel; CONTACT: Ruth McIntyre, 640 Jackson Street, St. Paul, MN 55101; 612/221-3992.

April, 1984

2-3 Annual Ophthalmology Specialty Course; University of Minnesota Medical School; Holiday Inn Downtown, Minneapolis; CONTACT: CME, U of M, Box 293 Mayo Memorial Building, 420 Delaware Street S.E., Minneapolis, MN 55455; 612/373-8012.

5-7 Second Annual Interdisciplinary Critical Care Conference; St. Paul-Ramsey Medical Center; Radisson Plaza, St. Paul; CONTACT: Ruth McIntyre, 640 Jackson Street, St. Paul, MN 55101; 612/221-3992.

6-7 Eye Enucleation; U of M Medical School; Jackson Hill, U of M, Minneapolis; CONTACT: Bart W. Galle, Ph.D., Interim Director, CME Office, Box 293 Mayo Memorial Building, 420 Delaware Street, S.E., Minneapolis, MN 55455; 612/373-8012.

For further information on *future* CME programs, contact CME and Meeting Services, Minnesota Medical Association, 2221 University Ave. SE, Suite 400, Minneapolis, MN 55414, 612/378-1875.

Classified Advertisements

Classified advertising rates are forty (40) cents a word; minimum monthly charge \$10.00, key number, \$2.00 additional. Replies to advertisements with key numbers should be mailed in care of Minnesota Medicine, 2221 University Ave. S.E., #400, Minneapolis 55414.

Placement of ads by telephone not accepted. We also reserve the right to decline or withdraw advertisements at our discretion. Every care is taken to avoid mistakes but responsibility cannot be accepted for clerical or printers errors.

Cancellation of ads must be made before the 10th of the preceding month's issue.

The Journal is not permitted to divulge the identity of advertisers who have replies sent to box numbers.

CARDIOLOGIST, ALLERGIST, AND INTERNIST-NEPHROLOGIST specialty positions available with Mankato Clinic, Ltd. Our 30 man multi-specialty group attracts specialty referrals from a southern Minnesota area of 200,000 population. Excellent group practice opportunity in All-American community with full hospital services; full range of group fringe benefits; liberal time off; salary first year; incentive pay thereafter. For more information call collect R. F. Roskens, Administrator, or Dr. B. C. McGregory, 507-625-1811.

FAMILY PRACTICE: BC/BE to work in 20 person multispecialty clinic located in beautiful river town. Outstanding salary and prerequisites. Starting date open. Call or write: M. T. Sprangers, M.D. Interstate Medical Center, P.A., Highway 61 West, Red Wing, MN, 55066. 612/388-3503.

OPPORTUNITY FOR qualified physicians at the Albert Lea Clinic, P. A., in Albert Lea, Minnesota. The clinic is a seventeen man multi-specialty group in primary and secondary care fields. The financial rewards are exceptional and practice challenges very attractive. There is a negotiated salary at top level for the first year. Senior physician participation begins at the end of the first year with a incentive income distribution plan plus expanded fringe benefits. The clinic has a low cost buy in with a maximum profit sharing plan. There is a top level insurance program, medical reimbursement program, and a full range of other benefits. A nearly new hospital in the city provides an exceptional place to work. These are choice practices in a delightful place to live. We are currently looking for physicians in Family Practice, in Otolaryngology, one OB-GYN. Please contact B. J. Boss, Administrator, Albert Lea Clinic, P. A., 1602 Fountain Street, Albert Lea, MN 56007. Phone 507-373-8251. Personal phone 507-377-1406 or contact L. E. Shelhamer, Jr., M.D., 507-373-8251 or personal phone 507-377-1530.

FINANCIAL PLANNING by a Certified Financial Planner. Free brochure. Jack Kehrberg, CFP; 3030 Harbor Ln. N., Room 200F; Minneapolis, Mn. 55441. Phone (612) 559-7176.

INTERNIST-NEPHROLOGIST-INTERNIST-GASTROENTEROLOGIST-INTERNIST-GENERALIST — Sought for multispecialty group practice in Northern Minnesota. New 175 bed hospital with dialysis unit, full diagnostic services and support facilities. Nationally acclaimed school system and broad range of recreational facilities. Excellent opportunity for aggressive internist. Liberal compensation system. Excellent fringes. Send curriculum vitae to: R. Dinter, M.D., Mesaba Clinic, 1814 14th Avenue East, Hibbing, MN 55746.

GENERAL SURGEON AND/OR OB/GYN SURGEON to join 10 doctor multi-specialty group in Owatonna, a community of 18,500 located 68 miles south of the Twin Cities and 42 west of Rochester. Present staff consists of 7 family practitioners, 2 internists, and 1 general surgeon. Other specialties in the community and a close working relationship with the Mayo Clinic, the University of Minnesota hospitals, and other metropolitan centers provide for excellent consultations. Guaranteed salary first year with incentive program thereafter. Group Health, disability, life and accident insurance, retirement profit sharing, and automobiles provided by corporation. Contact: J. D. Miller, M.D. or James Wilkus, Administrator, Owatonna Clinic, P.A., 134 Southview, Owatonna, MN 55060. Telephone (507) 451-1120.

WANTED: Ob-Gyn, family practitioner, pediatrician and internal medicine to join multi-specialty group. One month vacation, hunting, fishing and lake recreation area. Starting salary excellent, many fringe benefits included. Write: MINNESOTA MEDICINE (735), 2221 University Ave. SE, Suite 400, Minneapolis 55414.

(Continued on page 752)

Classified Advertisements

(Continued from page 751)

GENERAL SURGEON AND INTERNIST to join 8 family physicians and 2 internists. Recently remodeled and expanded clinic facility, 6 blocks from modern well-equipped 99 bed hospital, 45 minutes south of Minneapolis on 35W. First year salary guarantee, paid malpractice, life and disability insurance, vacation and study time.

Contact Darral Mischke, Clinic Administrator, Faribault Clinic Ltd. 924 N.E. 1st Street Faribault, MN. 55021.

LA CROSSE, WI — OTOLARYNGOLOGIST needed to join 50-physician multispecialty group to share expanding ENT patient load with one other young, board-certified otolaryngologist. Modern 350-bed hospital (presently with one ENT specialist), adjacent to clinic, has well-equipped and staffed O.R., extensive x-ray coverage (including CT and ultrasound), and 24-hour E.R. staffing. Clinic offers attractive and equitable compensation package, including first year guarantee plus incentive, and generous fringe benefits. La Crosse is a progressive, family-oriented city of 50,000 in the beautiful Mississippi River Valley with a medical referral area of over 175,000. Exceptional cultural, educational, and recreational opportunities locally. Contact P.S. Shultz, M.D., Medical Director, Skemp-Grandview-La Crosse Clinic, 815 S. 10th St., La Crosse, WI 54601. Phone (608) 782-9760.

INTERNIST, BOARD Certified or eligible, needed to join eleven physician clinic in Alexandria, Minnesota. Associated with well-equipped hospital. Subspecialty interests welcome, but need firm background in general internal medicine. Excellent benefits, starting salary \$50,000.00. For more information contact David Hellstern, Administrator, Alexandria Clinic P.A., 610 Fillmore Street, Alexandria, MN 56308 or call collect (612) 763-5123.

STAFF PSYCHIATRIST CMHC has an excellent opportunity for a staff psychiatrist. Must be board eligible. Programs include in-patient, out-patient, education and consultation, specialized services to children, the chronically mentally ill, and the chemically dependent delivered in conjunction with a seasoned team of multi-disciplinary mental health professionals including two part-time psychiatrists. Excellent four-season recreational area. Salary and fringe benefits negotiable. Contact: Donald E. Frees, ACSW, Area Program Director, P.O. Box 646, Bemidji, MN 56601. An Equal Opportunity Employer.

FAMILY PRACTITIONER position available with Man-kato Clinic Ltd. Our 30 man multi-specialty group attracts specialty referrals from a southern Minnesota area of 200,000 population. Excellent group practice opportunity in All-American community with full hospital services; full range of group fringe benefits, liberal time off, salary first year; incentive pay thereafter. For more information call collect R.F. Roskens, Administrator or Dr. B.C. McGregory 507-625-1811.

A BOARD CERTIFIED Family Physician is wanted for a satellite practice joining a medical group of 7 physicians, 6 board certified family doctors and 1 general surgeon. The satellite facility is 20 miles distance from a modern 56-bed accredited hospital. Excellent opportunity for growth and satisfaction; good area to raise family. Incentive plan part of package. Contact Kenneth A. Muckala, M.D. President, Wadena Medical Center, 4 NW Deerwood Avenue, Wadena, MN 56482 or call (218) 631-1360. Also contact Mr. James G. Lawson, Administrator, Tri-County Hospital, 418 N. Jefferson, Wadena, MN 56482 or call (218) 631-3510.

IMMEDIATE VACANCY for board certified/eligible psychiatrist. Practice includes 75% outpatient and consultation and 25% inpatients. Office adjacent to accredited acute care hospital, serving a population of 50,000 to 60,000. Opportunity to work with a large chemical dependency treatment center and county mental health center. Enjoy the quality of life in rural America, while being only 1½ hours from Minneapolis and St. Paul, Minnesota. Excellent salary and fringe benefits. Contact: Frederick W. Haack, Executive Director, Naeve Hospital, 404 Fountain Street, Albert Lea, Minnesota 56007, or call 507-373-2384.

INTERNIST, board certified/board eligible to join a soon to be vacated solo practice in Northfield, Minnesota. For an internist wishing to join a multi-specialty group and absorbing the current solo practice, this is also an option. Broad array diagnostic and clinical services provided locally and through specialties from the Twin Cities. Practice is established, stable, and with considerable potential. Two college community, excellent quality of life, short distance from Mayo Clinic as well. Call and send vitae to: Cliff Christiansen, Northfield City Hospital, 800 West Second Street, Northfield, Minnesota 55057 (Phone: 507-645-6661).

MEDICAL DIRECTOR — OB/GYN CLINIC TEACHING SERVICE position available at St. Mary's Hospital, Minneapolis, MN. Must be American board certified/eligible in Obstetrics and Gynecology, and be eligible for faculty appointment with the Department of OB/GYN, University of Minnesota. Additional training and/or experience in maternal and fetal medicine desirable. Responsibilities include supervision of residents and medical students on the OB service and patient care activities. Contact: Marian S. Adcock, Search Committee, St. Mary's Hospital, 2414 S. 7th Street, Minneapolis, MN 55454, (612) 338-2229 ext. 600.

INTERESTED IN MEDICAL computing? A new electronic bulletin board for use by Minnesota physicians has been established by the Minnesota Medical Computing Consortium under a grant from 3M. "The Minnesota Medical Conference Tree" can be dialed up at 612-434-6315. Set your modem at 300 baud, full duplex. This electronic conferencing service is free of charge.

PHYSICIAN DESIRES TWO (2) other Doctors to share large office, downtown Minneapolis. Approx. monthly rent, utilities, phone, etc. would be \$700-800. Call: 612-870-8448.

FOR RENT LUXURY SKI CONDO at the hill in Teton Village, Jackson Hole, Wyo. 4 spacious bedrooms with individual baths, super kitchen, fireplace, and whirlpool. Plan your winter vacation now! Wind River Condos #3, #6. 800-443-8613.

FOR RENT, \$1500 A MONTH, two bedroom oceanfront cottage with panoramic view of Atlantic overlooking site where PT 109, the World War II saga of President John Kennedy, was filmed. Exquisite fishing, excellent snorkeling, absolute rest, unmatched privacy, and gorgeously warm weather. Rent include utilities. Furnished. 26 miles from Key West, 25 miles from Marathon. Call 1-612-920-7818 after 6 PM. Prefer monthly rentals.

FAMILY PRACTICE for sale in small southern Minnesota community — office, equipment, and practice — reasonable. Call evenings. 612-388-7584.

ORTHOPEDIC SURGERY — LA CROSSE, WISCONSIN 50-physician multispecialty group seeking qualified orthopedic surgeon to join busy 2-physician department. 350-bed hospital, adjacent to clinic, includes comprehensive radiology service, full joint replacement systems, recently expanded Physical Therapy Department, and 24-hour E.R. staffing. Clinic offers attractive compensation including first year guarantee and incentive plus substantial fringe benefits. La Crosse is a progressive city of 50,000 in the beautiful Mississippi River Valley. Patient drawing area is approximately 175,000. Exceptional cultural, educational and recreational opportunities locally. Contact P. S. Shultz, M.D., Medical Director, Skemp-Grandview-La Crosse Clinic, 815 S. 10th St., La Crosse, WI 54601. Phone (608) 782-9760.

MEDICAL DIRECTOR A challenging position with HMO MINNESOTA, an affiliate of Blue Cross and Blue Shield of Minnesota. A qualified applicant will be a physician licensed by the State of Minnesota who has experience/knowledge in utilization review and quality assurance programs. Management background will be helpful. The Medical Director will be responsible for data analysis, review of ambulatory and in-patient care practices, and making appropriate recommendations directly to contracting physicians. Highly competitive compensation and benefit package plus the opportunity to work in an environment where new ideas and initiative are encouraged. Send a complete resume in strict confidence to: Verna Rozenberg, Mgr. Emp., HMO MINNESOTA, 3535 Blue Cross Road, P.O. Box 43179, St. Paul, MN 55164.

OBSTETRICIAN/GYNECOLOGIST — Board Certified or Board Eligible: to practice at Family Hospital in Milwaukee amid a wealth of progressive programs including: birthing rooms, sibling visitation, Nurse Midwifery Service, Teen Pregnancy Service, and Day Surgery suites. Guaranteed income and fringe benefits. Send CV to R. W. Timberlake, Vice President, Family Hospital, 2711 West Wells Street, Milwaukee, WI 53208 or call (414) 937-2225.
(Continued on page 754)

Classified Advertisements

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1984 CME CRUISE/CONFERENCES ON LEGAL-MEDICAL ISSUES — Caribbean, Mexican, Hawaiian, Alaskan, Mediterranean. 7-14 days in Winter, Spring, Summer. Approved for 18-24 CME Cat. 1 credits (AMA/PRA). Distinguished professors. FLY ROUNDTRIP FREE ON CARIBBEAN, MEXICAN, & ALASKAN CRUISES. Excellent group fares on finest ships. Registration limited. Prescheduled in compliance with present IRS requirements. Information: International Conferences, 189 Lodge Ave., Huntington Station, N.Y. 11746. (516) 549-0869.

FAMILY PHYSICIAN, board eligible, to join group of six Board Certified Family Practitioners and one Board Certified General Surgeon in Blue Earth, Minnesota. \$45,000.00 plus incentive bonus first year with full membership after first year. 4,000 population with practice area of 25,000 in South Central Minnesota. Economy is stable agricultural plus small clean industries. Connected hospital and clinic enlargements now under construction. Complete ancillary support including anesthesiology, radiology, pathology, etc. Contact Marjeane Werner, Clinic Administrator or Dr. Thomas E. Watts, Business Phone: (507) 625-7371. Blue Earth Medical Center, Ltd., 520 South Galbraith, Blue Earth, MN 56013.

OB GYN to join successful 12 physician practice in Faribault, MN, just 50 miles south of Mpls. on 35 W. 2 general surgeons, 2 internists, 8 family physicians. Busy OB practice. Newly remodeled clinic 5 blocks from modern well-equipped hospital. Guaranteed salary first year, incentive compensation thereafter. Disability, Life, Health, Malpractice insurance paid by the clinic. Profit sharing and pension plan as well as generous vacation and study time. Contact Darral Mischke, Administrator, Faribault Clinic, Ltd., 924 N.E. 1st St., Faribault, MN 55021. Telephone: 507-334-3921.

DERMATOLOGIST, Board certified/eligible to join progressive multi-specialty group of 40+ physicians. Pleasant growing community. Many outdoor recreational opportunities. High quality of life. Referral area, 150,000. Liberal financial benefits. Send curriculum vitae and references, ATTN: M. T. Anderson, M.D., 101 Willmar Avenue, Willmar, MN 56201.

GENERAL SURGEON, board certified or eligible, to join 15 doctor multi-specialty clinic in New Ulm, 90 minutes from Twin City metro area. Group includes emergency medicine, family practice, internal medicine, obstetrics and gynecology, orthopedics, pediatrics and general surgery. Associates include oncology, otolaryngology, pathology, radiology and urology. Contact Harold Fenske, administrator, collect — (507) 354-4101.

PSYCHIATRIST to join progressive multi-specialty group of 40+ physicians. Pleasant, growing community. Many outdoor recreational opportunities. High quality of life. Referral area: 150,000. Liberal financial benefits. Send curriculum vitae and references to ATTN: H.P. Hinderaker, M.D., 101 Willmar Avenue, Willmar, MN 56201.

FAMILY PRACTICE PHYSICIAN/PEDIATRICIAN — board eligible/certified physician to join supportive staff (5 FP's, 1 OB, 1 Peds, 1 PA, 2 Nurse Practitioners) to provide quality care in an established, successful HMO clinic. Located in central MN community of 50,000 (3 colleges, full recreational activities, 1 hour from Twin Cities). Full range group fringe benefits (competitive salary, liberal vacation, 2 wks education time with expenses, retirement fund, etc.). Full range FP responsibilities including OB. Contact Dr. Patrick M. Lalley, CMGHP, 1411 Germain St., St. Cloud, MN 56301. Phone: 612-253-5220.

FAMILY PHYSICIAN needed to join a Multispecialty Group in a growing area of Minnesota. The Group is young and progressive and provides a great opportunity to a Board-Certified Family Practitioner. A large hospital utilized for the hospitalization of patients with back up of specialists. The call schedule will allow you the opportunity to enjoy the cultural and recreational activities which are abundant in this area of Minnesota. Salary and fringe benefits are open and negotiable. If interested, please send your curriculum vitae to Minnesota Medicine (736), 2221 University Avenue SE, #400, Minneapolis 55414.

FAMILY PRACTITIONER — Join an active practice in Northern Minnesota. Two young F.P.'s are looking for one or two associates to replace retiring partner. Attractive clinic and 44 bed hospital in a friendly town of 2000. Contact W. Ofstedal, M.D., 218-435-1212, Fosston, Minnesota 56542.

Classified Advertisements

FAMILY PHYSICIAN wanted for established practice in N.E. Minneapolis. Contact Vijender Arora, M.D., 901 23rd Avenue N.E., Minneapolis, MN 55418. (Phone: 612-789-3531).

PRIMARY CARE PHYSICIAN — opportunity for internist or family practitioner in north suburban area. Contact Dr. Duane Orn, Northport Medical Center, 5415 Brooklyn Boulevard, Brooklyn Center, MN 55429. 612-533-8666.

FAMILY PHYSICIAN FOR PROGRESSIVE RURAL MINNESOTA CLINIC. New and superbly-equipped facility. A pleasant farming community in a physician shortage area, yet only 25 minutes from a metro area. A comfortable call schedule at nearby hospital. Gateway to Minnesota's famous lake country. Young and growing practice with excellent salary and benefits, ownership potential. Must be board-eligible. Call or write to Mr. Ralph Solhjem or Faris Keeling, M.D. at 218-354-2111 or write to Barnesville Area Clinic, P.O. Box 521, Barnesville, MN 56514.

MEDICAL OFFICE SPACE FOR RENT: Heart of downtown Minneapolis. Physicians in Medical Arts Building, 825 Nicollet Mall, wish to sublet their facilities to another physician on a part-time basis. Call (612) 332-5316.

ST. PETER REGIONAL Treatment Center, St. Peter, MN., has salaried positions for psychiatrists in several areas of clinical practice. We are a 600 bed psychiatric facility serving a multitude of disability groups including mentally ill, chemically dependent, mentally retarded, and mentally ill and dangerous. JCAH Accredited. Join an expanding group of academically oriented board certified psychiatrists with the University of Minnesota affiliations. Release time for teaching and research activities is available. St. Peter is a college town of 9,000 in the Minnesota River Valley with abundant outdoor recreation and good schools. We are located 65 miles south of the Twin Cities and 12 miles north of a university town of 40,000+. Salary up to \$75,000 per year with board certification and relevant clinical/academic/administrative experience. Contact Brian Gottlieb, M.D., Chief of Staff, at Minnesota Security Hospital, Sheppard Drive, St. Peter, MN. 56082 or call collect at 507-931-7127.

MEDICAL DOCTOR for ambulatory care. Prefer board eligible/board certified Internist or Family Physician with background in primary care internal med-

icine. Position offers: competitive salary, malpractice coverage, 30 days paid vacation, and other excellent fringe benefits, in JCAH accredited progressive medical center having a large patient population, adequate staffing, teaching, and research opportunities. Financial assistance for relocation. Equal opportunity employer. Send CV to David Engstrom, Chief of Staff, VA Medical Center, Fargo, ND 58102. (701) 232-3241, Ext. 204.

FAMILY PRACTICE OPPORTUNITY: Three man family practice clinic in Central Minnesota looking for additional family practitioner. Clinic attached to 124 bed excellent hospital. Package consists of annual salary with incentives, relocation expenses, disability, health and malpractice insurance, vacation and an early partnership. For information please call O. E. Wiger, M.D., Family Clinic P.A., 808 S.E. 3rd St., Little Falls, MN 56345. Tel 612-632-2301 office, or 612-632-9325 home.

IMMEDIATE OPENING for primary care physician. Either Family Practice or Internal Medicine. Midway area of Saint Paul. Contact David Klevan, M.D. at 612-645-0711. 451 North Dunlap, Saint Paul, MN 55104.

FAMILY PHYSICIANS: Asst. Professor/Instructor for University Unit of residency training program. 100% time annual appointment, academic level dependent upon years of experience. Teaching, advising, research opportunities. Initial duties as Assoc. Unit Director. C.V., letter & refs. to: Search Committee, MS 360, Family Practice, U of MN, Box 381 Mayo, 516 Delaware St. SE, Mpls., MN 55455. (612) 373-8579. The University of Minnesota is an Equal Opportunity Educator and Employer and Specifically Invites and Encourages Applications from Women and Minorities.

FAMILY PHYSICIAN to join a family practitioner in an established rural, community clinic (population 2,500; service area 8,000). Newly built, well-equipped facility. Offers an excellent practice opportunity and growth potential. Must be board eligible. Barnesville, MN is a friendly, pleasant community located 15 minutes from beautiful lake country and 25 minutes from the Fargo/Moorhead area (population 130,000). Call or write Ralph C. Solhjem, St. Ansgar Hospital, 715 North 11th Street, Moorhead, MN 56560 — (218) 299-2363 or Faris Keeling, M.D., Barnesville, MN (218) 354-2111. *(Continued on page 756)*

(Continued from page 755)

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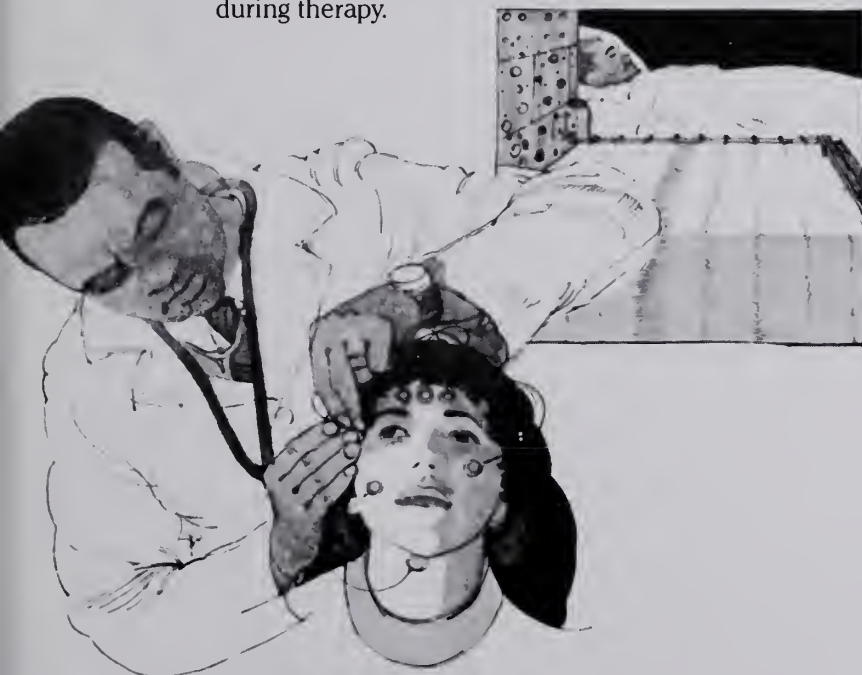
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- Contraindicated in patients who are pregnant or hypersensitive to flurazepam.
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Contraindications: Known hypersensitivity to flurazepam HCl; pregnancy. Benzodiazepines may cause fetal damage when administered during pregnancy. Several studies suggest an increased risk of congenital malformations associated with benzodiazepine use during the first trimester. Warn patients of the potential risks to the fetus should the possibility of becoming pregnant exist while receiving flurazepam. Instruct patient to discontinue drug prior to becoming pregnant. Consider the possibility of pregnancy prior to instituting therapy.

Warnings: Caution patients about possible combined effects with alcohol and other CNS depressants. An additive effect may occur if alcohol is consumed the day following use for nighttime sedation. This potential may exist for several days following discontinuation. Caution against hazardous occupations requiring complete mental alertness (e.g., operating machinery, driving). Potential impairment of performance of such activities may occur the day following ingestion. Not recommended for use in persons under 15 years of age. Though physical and psychological dependence have not been reported on recommended doses, abrupt discontinuation should be avoided with gradual tapering of dosage for those patients on medication for a prolonged period of time. Use caution in administering to addiction-prone individuals or those who might increase dosage.

Precautions: In elderly and debilitated patients, it is recommended that the dosage be limited to 15 mg to reduce risk of oversedation, dizziness, confusion and/or ataxia. Consider potential additive effects with other hypnotics or CNS depressants. Employ usual precautions in severely depressed patients, or in those with latent depression or suicidal tendencies, or in those with impaired renal or hepatic function.

Adverse Reactions: Dizziness, drowsiness, lightheadedness, staggering, ataxia and falling have occurred, particularly in elderly or debilitated patients. Severe sedation, lethargy, disorientation and coma, probably indicative of drug intolerance or overdosage, have been reported. Also reported: headache, heartburn, upset stomach, nausea, vomiting, diarrhea, constipation, GI pain, nervousness, talkativeness, apprehension, irritability, weakness, palpitations, chest pains, body and joint pains and GU complaints. There have also been rare occurrences of leukopenia, granulocytopenia, sweating, flushes, difficulty in focusing, blurred vision, burning eyes, faintness, hypotension, shortness of breath, pruritus, skin rash, dry mouth, bitter taste, excessive salivation, anorexia, euphoria, depression, slurred speech, confusion, restlessness, hallucinations, and elevated SGOT, SGPT, total and direct bilirubins, and alkaline phosphatase; and paradoxical reactions, e.g., excitement, stimulation and hyperactivity.

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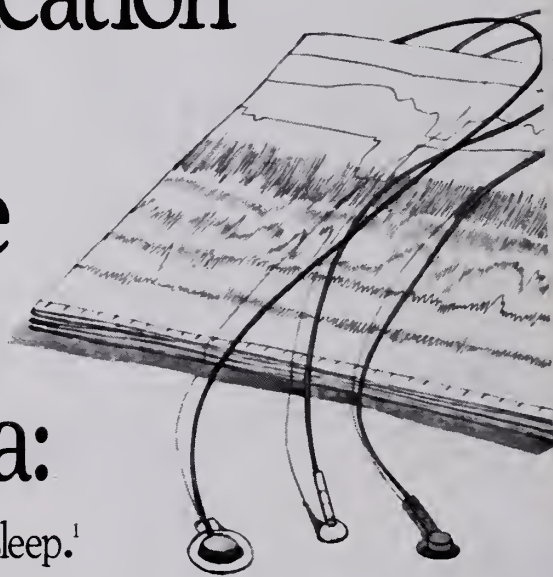
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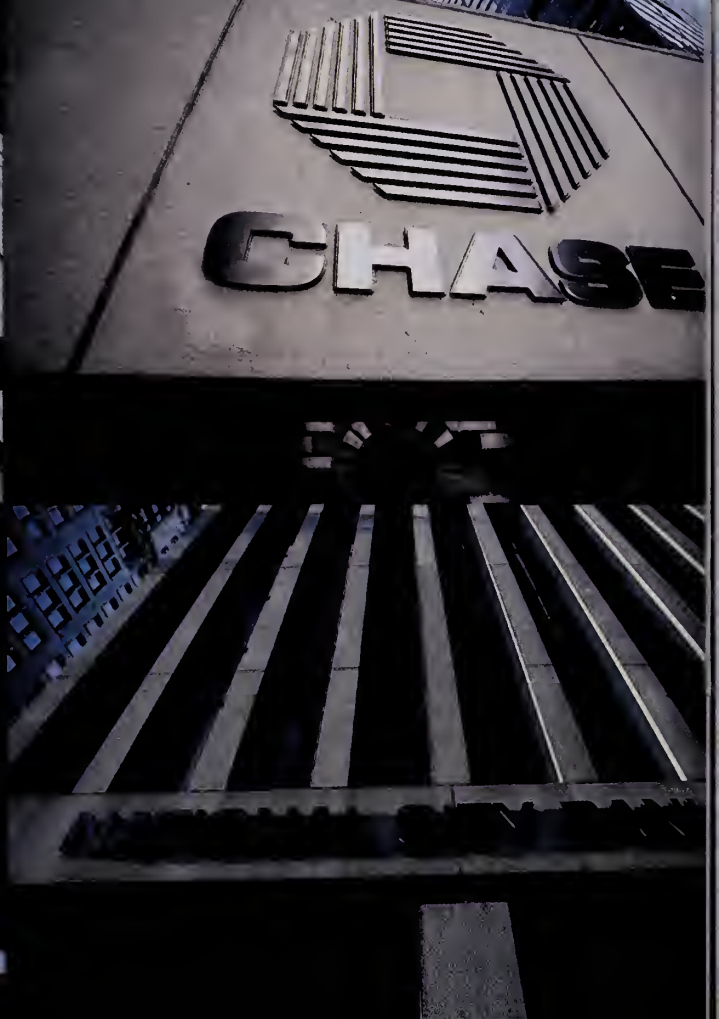
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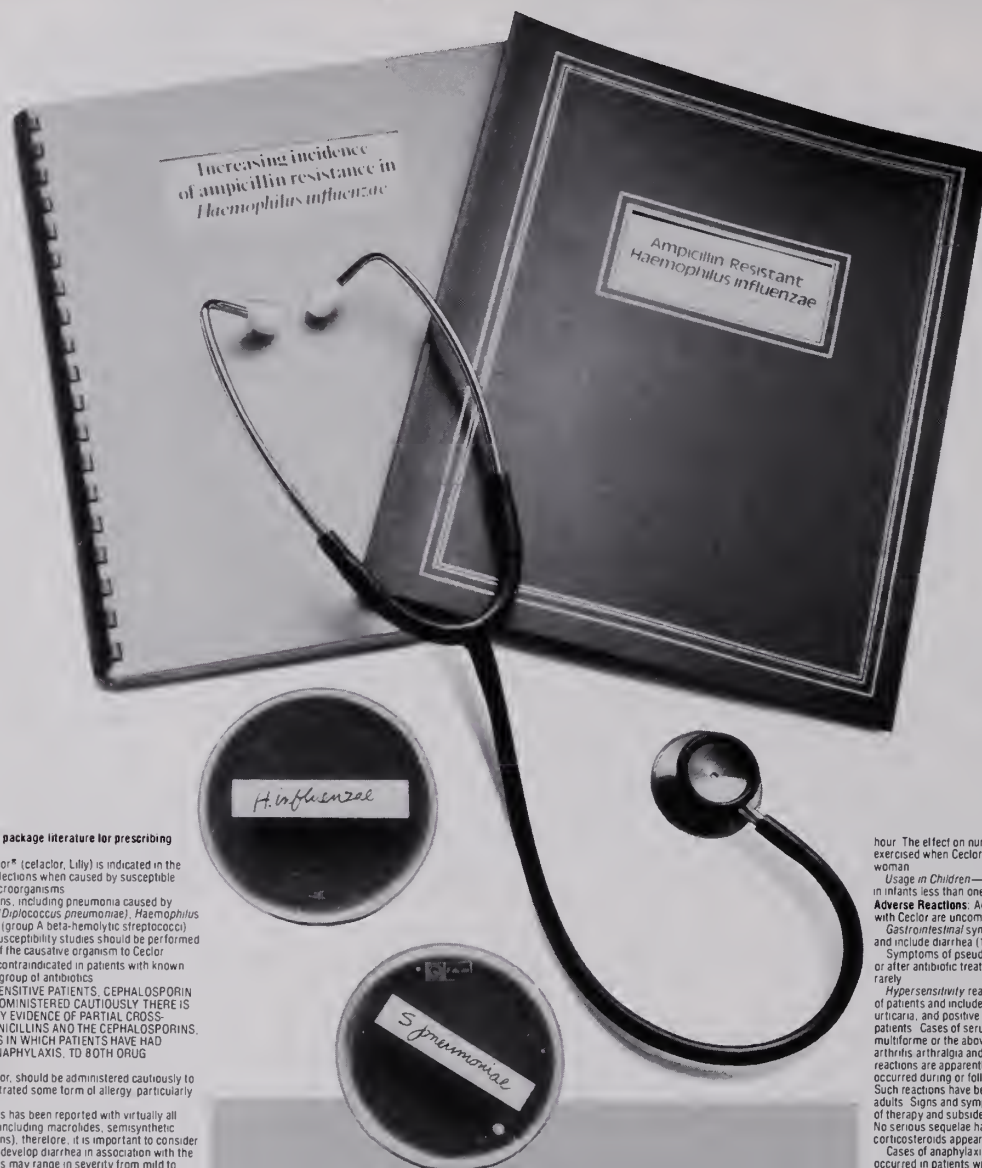
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An added complication... in the treatment of bacterial bronchitis*



Brief Summary. Consult the package literature for prescribing information.

Indications and Usage: Ceclor® (cefaclor, Lilly) is indicated in the treatment of the following infections when caused by susceptible strains of the designated microorganisms:

Warnings: IN PENICILLIN-SENSITIVE PATIENTS, CEPHALOSPORIN ANTIBIOTICS SHOULD BE ADMINISTERED CAUTIOUSLY THERE IS CLINICAL AND LABORATORY EVIDENCE OF PARTIAL CROSS-ALLERGENICITY OF THE PENICILLINS AND THE CEPHALOSPORINS. AND THERE ARE INSTANCES IN WHICH PATIENTS HAVE HAD REACTIONS, INCLUDING ANAPHYLAXIS, TO BOTH DRUG CLASSES.

Contraindication: Ceclor is contraindicated in patients with known allergy to the cephalosporin group of antibiotics.

Antibiotics: including Ceclor, should be administered cautiously to any patient who has demonstrated some form of allergy, particularly to drugs.

Pseudomembranous colitis has been reported with virtually all broad-spectrum antibiotics (including macrolides, semisynthetic penicillins, and cephalosporins), therefore, it is important to consider its diagnosis in patients who develop diarrhea in association with the use of antibiotics. Such colitis may range in severity from mild to life-threatening.

Treatment with broad-spectrum antibiotics alters the normal flora of the colon and may permit overgrowth of clostridia. Studies indicate that a toxin produced by *Clostridium difficile* is one primary cause of antibiotic-associated colitis.

Mild cases of pseudomembranous colitis usually respond to drug discontinuance alone. In moderate to severe cases, management should include sigmoidoscopy, appropriate bacteriologic studies, and fluid, electrolyte, and protein supplementation. When the colitis does not improve after the drug has been discontinued, or when it is severe, oral vancomycin is the drug of choice for antibiotic-associated pseudomembranous colitis produced by *C. difficile*. Other causes of colitis should be ruled out.

Precautions: General Precautions—If an allergic reaction to Ceclor occurs, the drug should be discontinued, and, if necessary, the patient should be treated with appropriate agents, e.g., pressor amines, antihistamines, or corticosteroids.

Prolonged use of Ceclor may result in the overgrowth of nonsusceptible organisms. Careful observation of the patient is essential. If superinfection occurs during therapy, appropriate measures should be taken.

Positive direct Coombs' tests have been reported during treatment with the cephalosporin antibiotics. In hematologic studies or in transfusion cross-matching procedures when antiglobulin tests are performed on the minor side or in Coombs' testing of newborns whose mothers have received cephalosporin antibiotics before parturition, it should be recognized that a positive Coombs' test may be due to the drug.

Ceclor should be administered with caution in the presence of markedly impaired renal function. Under such conditions, careful clinical observation and laboratory studies should be made because safe dosage may be lower than that usually recommended.

As a result of administration of Ceclor, a false-positive reaction for glucose in the urine may occur. This has been observed with Benedict's and Fehling's solutions and also with Clinestix® tablets but not with Tes-Tape® (Glucose Enzymatic Test Strip, USP, Lilly).

Broad-spectrum antibiotics should be prescribed with caution in individuals with a history of gastrointestinal disease, particularly colitis.

Usage in Pregnancy—Pregnancy Category B—Reproduction studies have been performed in mice and rats at doses up to 12 times the human dose and in fetuses given three times the maximum human dose and have revealed no evidence of impaired fertility or harm to the fetus due to Ceclor. There are, however, no adequate and well-controlled studies in pregnant women. Because animal reproduction studies are not always predictive of human response, this drug should be used during pregnancy only if clearly needed.

Nursing Mothers—Small amounts of Ceclor have been detected in mother's milk following administration of single 500-mg doses. Average levels were 0.18, 0.20, 0.21, and 0.16 mcg/ml at two, three, four, and five hours respectively. Trace amounts were detected at one

Some ampicillin-resistant strains of *Haemophilus influenzae*—a recognized complication of bacterial bronchitis*—are sensitive to treatment with Ceclor.¹⁻⁶

In clinical trials, patients with bacterial bronchitis due to susceptible strains of *Streptococcus pneumoniae*, *H. influenzae*, *S. pyogenes* (group A beta-hemolytic streptococci), or multiple organisms achieved a satisfactory clinical response with Ceclor.⁷

Ceclor®

cefaclor

Pulvules®, 250 and 500 mg

hour. The effect on nursing infants is not known. Caution should be exercised when Ceclor® (cefaclor, Lilly) is administered to a nursing woman.

Usage in Children—Safety and effectiveness of this product for use in infants less than one month of age have not been established.

Adverse Reactions: Adverse effects considered related to therapy with Ceclor are uncommon and are listed below.

Gastrointestinal symptoms occur in about 2.5 percent of patients and include diarrhea (1 in 70).

Symptoms of pseudomembranous colitis may appear either during or after antibiotic treatment. Nausea and vomiting have been reported rarely.

Hypersensitivity reactions have been reported in about 1.5 percent of patients and include morbilliform eruptions (1 in 100). Pruritus, urticaria, and positive Coombs' tests each occur in less than 1 in 200 patients. Cases of serum-sickness-like reactions (erythema multiforme or the above skin manifestations accompanied by arthritis, arthralgia and, frequently, fever) have been reported. These reactions are apparently due to hypersensitivity and have usually occurred during or following a second course of therapy with Ceclor. Such reactions have been reported more frequently in children than in adults. Signs and symptoms usually occur a few days after initiation of therapy and subside within a few days after cessation of therapy. No serious sequelae have been reported. Antihistamines and corticosteroids appear to enhance resolution of the syndrome. Cases of anaphylaxis have been reported, half of which have occurred in patients with a history of penicillin allergy.

Other effects considered related to therapy included eosinophilia (1 in 50 patients) and genital pruritus or vaginitis (less than 1 in 100 patients).

Causal Relationship Uncertain—Transitory abnormalities in clinical laboratory test results have been reported. Although they were of uncertain etiology, they are listed below to serve as alerting information for the physician.

Hepatic—Slight elevations of SGOT, SGPT, or alkaline phosphatase values (1 in 40).

Hematopoietic—Transient fluctuations in leukocyte count, predominantly lymphocytosis occurring in infants and young children (1 in 40).

Renal—Slight elevations in BUN or serum creatinine (less than 1 in 500) or abnormal urinalysis (less than 1 in 200).

(061782R)

*Many authorities attribute acute infectious exacerbation of chronic bronchitis to either *S. pneumoniae* or *H. influenzae*.⁸
Note: Ceclor is contraindicated in patients with known allergy to the cephalosporins and should be given cautiously to penicillin-allergic patients.

Penicillin is the usual drug of choice in the treatment and prevention of streptococcal infections, including the prophylaxis of rheumatic fever. See prescribing information.

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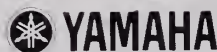
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President's Letter



Destructive Salvation

"You see, sir, in order to save the village, we had to destroy it."

This monument to inconsistency was the response of an American soldier in Vietnam, to a question from a TV interviewer. It was heard nation wide on evening news programs. It illustrates more vividly than any carefully crafted and thought out statements the paradox presented by human motivations, behavior based on those motivations and the corresponding evaluations of results. To the soldier who had risked his life to gain control of the village, the top priority was that the village be "saved" from Vietcong control. Better that it cease to exist than to be in enemy control, a view not shared by those whose homes were destroyed, and whose families were killed in the process of their "salvation".

Had one taken an immediate poll of the American public who heard this statement, there would have been a spectrum of opinions regarding the ethical validity of this decision to destroy the village in the process of saving it. This spectrum of opinion would exist because each person would evaluate the question from his/her own complex background of beliefs, value systems, priorities, experiences, and emotional make-up. To a person with humanistic orientation and thought processes who is far removed from the combat scene, to destroy something in the concept of saving it is bizarre enough to be the basis of a bad joke at the best and at worst the vicious manipulations of political ogres who, in their view, can have no ethical credibility. To a soldier who is forced against his will to be in a situation of killing and being killed such paradoxical motivation may be an absolute necessity.

The pertinence of this point to the affairs of doctors, their patients, and organized medicine is that any given circumstance and any effort to relate or respond

to such circumstance is inevitably judged by the people involved from a variety of viewpoints. Each viewpoint has its own inherent validity and can be reasonably and vigorously defended. Strong emotion can be, and usually is, generated in this process and feelings run high against people of differing backgrounds, differing circumstances and thereby, differing conclusions.

Thus, to the majority of doctors in our area, there is strong motivation to save fee-for-service medicine and to organize in such a way as to accomplish this. In the process, anger is projected toward the MMA and other levels of organized medicine for not having more vigorously and effectively defended traditional medical practice against its apparent disintegration. There is strong motivation to abandon traditional organizational structures and reunite on economic grounds to fight the economic wars which lie ahead. The fallacy of this concept, I feel, is that *we then will be fighting each other and with absolute certainty lose the real battle which is against those who would move the entire medical profession out of the way, deprofessionalize it, (in effect, decommission it) and send doctors out to find jobs with whatever company they can latch on to which is marketing medicine in their areas.*

All of this has the utmost importance to organized medicine in these days of profound change. A millennia old concept that the healing of sickness would be best accomplished by placing oneself under the care of a person who has qualified him/herself to become a physician is now being challenged and rapidly changed. The new concept is that one places oneself in the care of an organization and/or a health plan. The corporation or plan will provide the per-

sonnel to do the job, and the qualifications of the personnel is the business of the corporation and of little concern to the patient. Many people have come to believe that the technology applied to one's illness is of paramount importance, and the person or persons who apply the technology is of secondary importance. Thus, "physicianhood" is of declining significance. (Any resemblance to "priesthood" is fully intended.)

In this setting, the question is whether a voluntary organization of physicians can remain a viable and effective factor in the affairs of physicians, and can it at the same time serve a public need in a way that individual physicians of whatever payment mechanism cannot serve? As the economic pressures become over-whelming factors for change, I repeat, it will require maximum dedication to the concepts and interests that bind us physicians to avoid our being splintered into groups representing only our economic interests with growing hostility amongst us.

My own answer to this question is that such an organization *can* remain viable and effective for physicians, and it *can* serve a vital public function. I would go much further and offer the opinion that the federation of medicine and the several organizations that it has spawned are the *only* hope that we physicians have to avoid becoming mere medical engineers and technicians, totally subservient to the powerful commercial interests and governmental agencies that are vying for control of health care, which control will bring enormous monetary and political profits to the controllers.

Essential to our viability as an organization is for us to recognize that organized medicine must embrace all payment systems and all delivery systems in which physicians are the primary providers of the medical care delivered. My own bias is that fee-for-service medicine offers the best, most flexible and responsive system for delivering medical care to most of our population. I do not believe that this means that those who practice medicine in prepaid plans are any less competent physicians. The system under which they practice by design puts economic pressure on them to minimize services. They are aware of this and are working to guard against this resulting in poor care even as fee-for-service doctors, through the PSRO, Private Review, the Coalition for Health Care Costs and PHP have worked to guard against the waste and extravagance that is an inherent problem in fee-for-service medicine. Furthermore, those of us who have labored for PSRO know full well that cases of inadequate and inept health care are far from absent in fee-for-service medicine.

A final point I would make in this regard is that when DRGs are extended to physicians and to all payment systems, the current distinction between fee-for-service and prepaid plans will be blurred. *We will all be prepaid doctors.*

I believe that we need prepaid doctors' participation in organized medicine and that there is much common ground that we fee-for-service physicians have with them as physicians. Our real enemies are not each other but the host of opponents that are lined up against *all* physicians.

Many of my friends and colleagues differ sharply from this opinion. Many feel that organized medicine should be *only* for the fee-for-service doctors. My rejoinder to this is that in a society which is seriously considering extending the franchise for treating the sick to *many* disciplines, both scientific and otherwise (and which in many states has already done so) the only chance we have to retain the dominance of physicians in health care is to be better by virtue of our training and experience at caring for the sick than are other groups and to effectively, as a unified profession, respond to public need in any area in which our knowledge is pertinent.

This year I am being made aware of the many areas in which organized medicine is active in promoting the public good and at the same time promoting the welfare of patients and interests of physicians. I have been profoundly impressed at how the legislative process, legal process, operation of governmental agencies and functions of the media all need and get on a daily basis effective input from the medical profession by the MMA and other levels of the federation of medicine.

Trial attorneys, for example, have the goal this year of passing legislation that would make patients the owners of the physical medical record which they would be free to take on demand and to institute prejudgment interest which would, of course, be ruinous to malpractice insurance companies. Issues, such as these, are of concern to *all* physicians.

I am also deeply impressed with the energy and expertise that is going into our new marketing program which will offer service to all physicians, regardless of their source of payment thus helping them to become more effective and more efficient in their practices. This will afford them every opportunity to compete effectively in the new economic, competitive environment in which we find ourselves.

It is "touch and go" as to whether our individual economic and political interests will cause us to fragment into five or six divergent groups, each then subject to further fragmentation, thus, destroying the

PRESIDENT'S LETTER

effectiveness that we now have in these vital areas.
I feel that those who would have the MMA serve only the interests of fee-for-service medicine are moving in the same direction and for similar motivations

as the soldier who could destroy the village in order to save it.



Donald C. Bell, M.D.
President
Minnesota Medical Association

Pediatric Advanced Life Support

A program of first-hour care of critically ill or injured children, January 26 and 27, 1984, The Inn, St. Paul.

Offered by Children's Hospital of St. Paul, the fee is \$150 for physicians. Participants eligible for 16 hours of AMA Category I credit.

For information or to register: contact Leslie Fishman, MD, Director of Emergency Services, Children's Hospital, 345 North Smith Avenue, St. Paul, MN 55102, (612) 298-8236.

Board of Medical Examiners

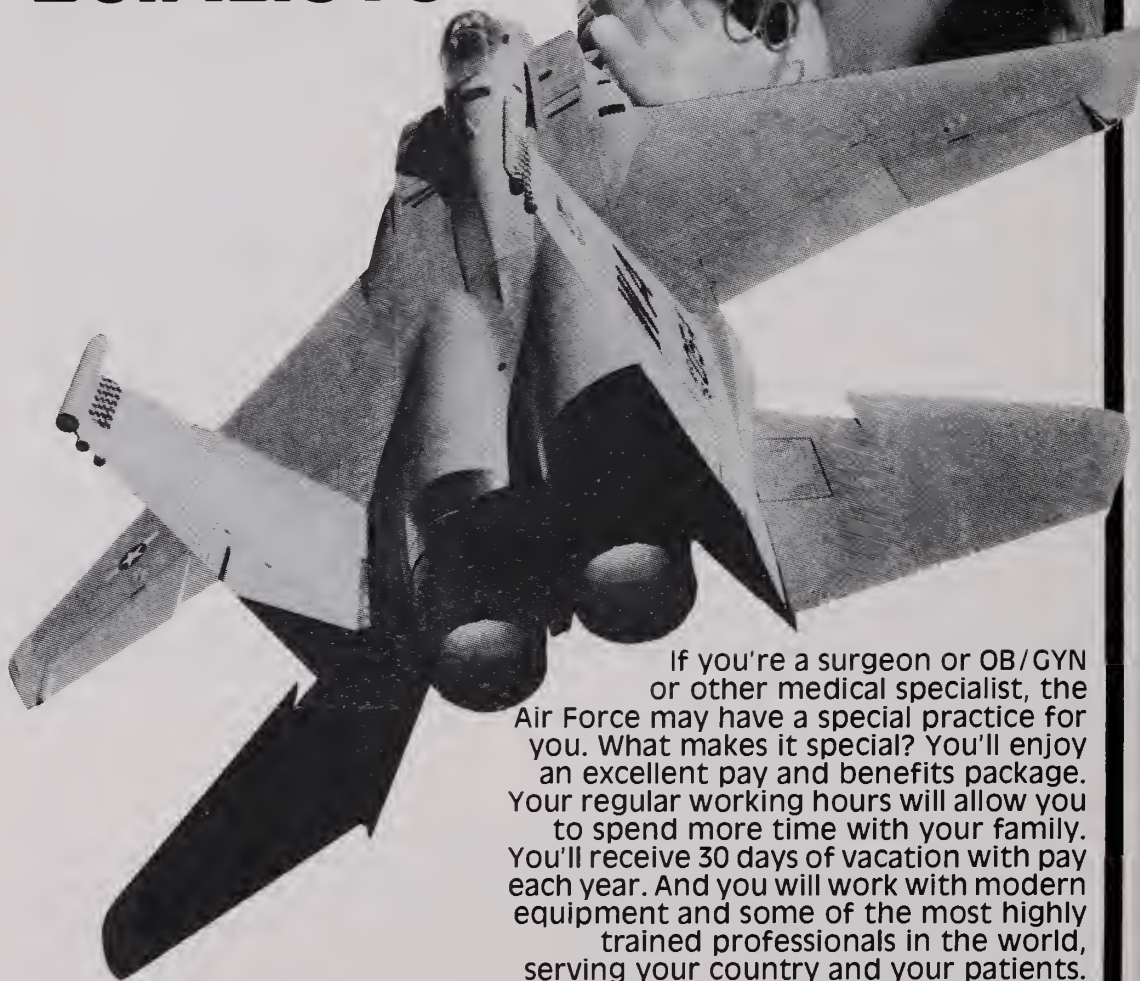
An error was made in the notice for renewal of licensure to practice medicine in Minnesota sent out by the Minnesota Board of Medical Examiners. Those who have birthdates in May, June, July and August, and were licensed in years *other than* 1978, 1979 and 1980 were sent incorrect instructions and renewal cards in regards to the reporting of Continuing Medical Education. Those physicians in this group licensed before 1978 were instructed that they were not required to report CME's, however they will be required to report in order to renew their license for 1984. The correct renewal card may be obtained upon request from the Board's office at (612) 623-5534 (717 Delaware Street SE, Suite 352, Minneapolis, MN 55414). Those in this group, licensed after 1980 were instructed that they had to report their CME in order to renew for 1984, they do not. These doctors may renew with the materials they received, the CME portion of the card may be ignored. Those individual physicians or medical clinics wishing clarification of their status may do so by contacting the Board's office at the above address. The Board sincerely apologizes for this error on our part and on the part of the state computer system.

Asthma Update

The American Lung Associations in Minnesota are publishing a new newsletter entitled *Asthma Update*, containing information for parents of children with asthma, to help them better understand and control the disease. Subscriptions are free and may be obtained by writing to:

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Editor's Notebook

Two Christmas Gifts from the Editor

When you picked up this issue, you may have asked: Why is it so thin?

It's thin because I'm giving you two gifts — the gift of money and the gift of time. After all, it's Christmas, and you deserve at least one gift. So why not two?

This sparse issue saves you money because our greatest expenses are composition and printing expenses. Our standard monthly issue runs 72 pages. By cutting this December issue to 34 pages, we are saving the Association roughly \$8,500. Not bad, especially in a month in which you will pay the year-end expense of \$375 to remain a member of the Minnesota Medical Association.

But I will not delude you. Because of our big November issue on "Medicine and the Coming of Corporations," because of the expenses the Association has allocated to MINNESOTA MEDICINE, and because of our sharply declining national advertising revenues, we have exceeded our budget. In my view, a barebones skeletal December issue is a responsible gift to give.

Enough about money, what about time? Well, as I see it, a skinny issue ought to free up reading time for you. Besides, after the November feast of 100 pages, your brain needs rest. I know mine does, especially the left side. The left brain, as you know, is the scientific side — the side that processes one stimulus at a time, in an orderly sequence with a focus on the logical answer. The right side, the wild side, takes on whole clusters of stimuli simultaneously, grasping them as whole chunks. The left is good at information processing and rigid classification; the right excels at handling emotions, the unknown, the intuitive, the unconventional, the ambiguous, and the creative. But invaluable as it is, the right won't get you into medical school, through a busy day in practice, or around the medical-legal thickets.

But Christmas is the right time for the right brain — a time of images, emotions, discovery, and surprise. When it comes to Christmas, I'm a hopeless rightwinger of the cerebral hemispheres.

So make good use of this time you're receiving. Time is a unique resource. You cannot rent, hire, buy, or make it. You can't even store it. It is irreplaceable, inelastic, perishable, and in short supply. Everything you do takes more of it, and you can't do anything without it. Savor this asset this holiday. Take tender loving care of it. Enjoy it.

Merry Christmas to you and your families

Richard L. Reese MD

Survival after Valve Replacement Surgery

CHARLES R. PETERSON, M.D.,* and H. K. HELSETH, M.D.*

Two-hundred eighty-two consecutive patients referred for cardiac valve replacement had periodic follow-up surveys to determine survival and late post-operative complications. Five year survival was 76% for all patients; 84% in patients without coronary artery disease; 42% in patients with coronary artery disease. The most common cause of late death was heart failure (19 of 43 patients) and 68% of these patients had coronary artery disease. Twenty-nine patients had significant thrombo-embolic complications that caused or likely contributed to death in 8 patients. Three patients died of bacterial endocarditis. The factors with the greatest adverse effect on survival were myocardial failure and associated coronary artery disease. The incidence of endocarditis and coagulation complications was high enough, however, to emphasize the need for careful follow-up care.

IN THE TWO decades since routine cardiac valve replacement surgery became available, surgical techniques have improved and there has been the introduction of new types of valves and coronary artery bypass. In addition, most centers have seen a decline in the number of patients with rheumatic valvular disease and an increase in the proportion of patients with valve pathology due to connective tissue disorders and ischemic heart disease.

These changes in cardiac valve surgery make it important to periodically review the results. This study reviews the results of 282 consecutive patients referred for valve replacement over a 10-year period from 1971 to 1981.

Patients and Methods

From 1971 through 1980, 282 patients evaluated by the Cardiology Section of the St. Louis Park Medical Center were referred to our surgical team for cardiac valve replacement surgery. To obtain follow-up morbidity and mortality information, patients who were not examined regularly had telephone and/or mailed questionnaire surveys in 1976, 1978, and 1981. The study group consisted of 163 men (age range 15 to 82) and 119 women (age range from 18 to 84). The mean age of the men was 54.7 years and the mean age of the women was 56.8 years. This follow-up study did not include patients referred for valve replacement from Hennepin County Medical Center.

Patients who had elective surgery had hemo-

dynamic and angiographic studies and most patients over 40 years of age also had selective coronary arteriographic studies. The pathology and apparent etiology of the valvular abnormality was determined at the time of surgery and the incidence of coronary artery disease (CAD) was determined on the basis of coronary arteriographic findings. Operative information tabulated for this study included the type of valve used for replacement, associated operative procedures on the aorta and coronary arteries, and the number of left ventricular aneurysmectomies.

Primary emphasis in follow-up questions was on thrombo-embolic and bleeding complications since most patients were receiving anticoagulant therapy with Coumadin. In addition, attempts were made to determine as precisely as possible the cause of all late deaths.

Cardio-thoracic (CT) ratios were calculated by dividing the widest transverse diameter of the heart by the widest transverse diameter of the chest at the inner rib margin on a six-foot posterior anterior chest roentgenogram. The mean time interval after surgery that postoperative CT ratios were measured was 11.5 months (4 months to 21 months).

Survival calculations were done by the life table method.¹ The incidence of thrombo-embolic and bleeding complications was calculated per 100 patient-years (or percent per year) of follow-up. There were 931 patient-years follow-up for the entire study group.

Results

Pathology and Pathophysiology

The etiology of the valvular pathology and the

*Sections of Cardiology and Cardiovascular Surgery, Park-Nicollet Medical Center and Hennepin County Medical Center, Minneapolis.

Supported by the Park-Nicollet Medical Center Research Foundation.

Follow-up information was obtained with the assistance of the Health Services Research Center, Paul B. Batalden, Director.

number of patients in each subset with coronary artery disease are shown in Table 1. Rheumatic pathology was found in only 4.5% of the patients with isolated aortic valve pathology as compared to 62% of the patients with mitral valve pathology. Valvular pathology due to connective tissue disease was present in 30 percent of all patients.

Significant coronary artery disease was present in 24 (68 of 282) percent of patients. Twelve patients had mitral valve replacement because of severe mitral regurgitation caused by ischemic pathology of the myocardium and papillary muscles. Eleven patients with mitral or double valve replacement also had left

ventricular aneurysms.

The mean hemodynamic measurements for each group of valve replacement patients are listed in Table 2.

Valve Types and Coronary Surgery

The different types of prosthetic valves used for replacement in the 282 patients (322 valves) are listed in Table 3. Most of the earlier patients in this series had Starr-Edwards ball valves with cloth covered struts. A change was made to the tilting disc Bjork-Shiley valve when several patients with Starr-Edwards valves had to be re-operated because of

TABLE 1
Etiology of 282 Patients with Cardiac Valve Replacement

	Aortic	Mitral	Aortic-Mitral	Totals
Rheumatic	6 (1)	62 (8)	30 (5)	98 (14)
Calcific	83* (24)	3 (1)	—	86 (25)
Connective Tissue	44** (6)	31 (8)	10 (3)	85 (17)
Hypertrophic Subaortic Stenosis	1			1
Coronary Artery Disease Only		12 (12)		12 (12)
Totals	134 (31)	108 (29)#	40 (8)#	282 (68)

* 23 patients had bicuspid aortic valves

** 28 patients also had cystic medial disease of the aorta

11 patients had aneurysms of the left ventricle

() Parentheses indicate numbers of patients with significant coronary artery disease

TABLE 2
Mean Hemodynamic Measurements

Patient Group	Cardiac Index (L/Min/M ²)	Pressures (mm Hg)						Valve Area* (cm ²)
		RA	PA	PAW	LVD	LVS	AoS	
Aortic Valve Replacement	2.62	4	25	17	21	184	134	0.6
Mitral Valve Replacement	2.20	8	35	24	14	131	128	0.8
Double Valve Replacement	2.47	8	36	22	15	157	131	—

*Valve areas calculated on patients with stenotic lesions only; average systolic gradient on patients with aortic stenosis was 73 mm Hg; diastolic gradient with mitral stenosis was 13 mm Hg.

Abbreviations: RA = right atrium; PA = pulmonary artery; PAW = pulmonary artery wedge; LVD & LVS = LV diastolic and LV systolic; AoS = aortic systolic.

TABLE 3
Type of Valve Replacement in 282 Patients

Valve Type	Valves Replaced			Totals
	Aortic	Mitral	Aortic-Mitral	
Starr-Edwards	11		8	19
		29	11	40
	105*		31	136
Bjork-Shiley		59	22	81
	13			13
		20	6	26
Tissue#	5			5
			1	1
			1	1
Totals	134	108	40	322

* Includes 26 composite aortic valve and ascending aorta replacements

Porcine or pericardial prostheses

hemolytic anemia or prosthesis dysfunction due to fraying of the cloth covering the cage struts. In recent years tissue valves (porcine or pericardial) have been used selectively in elderly and other patients where potential bleeding complications from Coumadin therapy was a concern.

Twenty-six patients with aortic regurgitation due to aneurysmal dilatation of the ascending aorta had composite replacement of both the ascending aorta and the aortic valve. A Bjork-Shiley prosthesis attached to a teflon aortic graft was used in all 26 patients.² Six of the 26 patients had emergency surgery due to acute dissection of the ascending aorta.

Fifty-four of the 68 patients with CAD had coronary artery vein bypass grafts (1.5 grafts/patient). Fourteen patients with coronary artery disease did not have bypass grafts because of totally occluded coronary arteries that had caused infarction of the myocardium supplied by the occluded coronary arteries. Eleven patients had left ventricular aneurysmectomies along with mitral or double valve replacements.

Operative Mortality

Operative mortality for all patients and subsets of patients are indicated in parentheses in the one month survival column (100% minus survival) in Table 4.

Operative mortality for all 282 patients was 6%. For all 214 patients without CAD, operative mortality was 3%. In contrast, operative mortality for the 68 patients with coronary artery disease and valve replacement was 13%.

As an independent variable, age had no influence on operative mortality. In the patients without coronary artery disease, operative mortality both over and under the age of 70 years was 3%.

There was one operative death in the 26 patients with composite replacement of the aorta and aortic valve (a 62 year old woman who also had CAD). Six of the 26 patients with composite aortic valve surgery

LONG TERM SURVIVAL AFTER VALVE REPLACEMENT

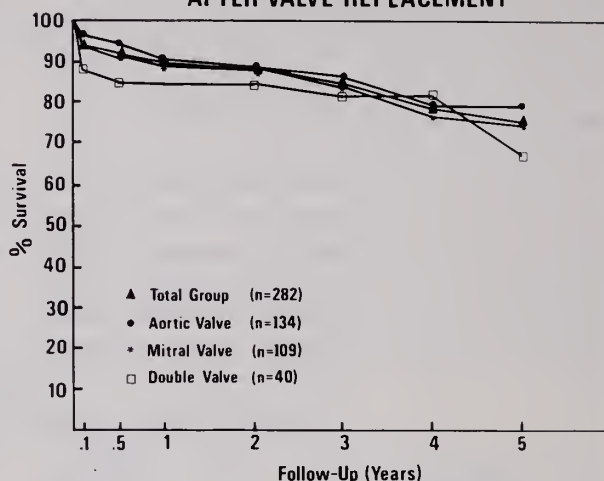


Figure 1 — Percent survival after valve replacement in all 282 patients and subsets with aortic, mitral and aortic-mitral (double) valve replacement.

LONG TERM SURVIVAL AFTER VALVE REPLACEMENT

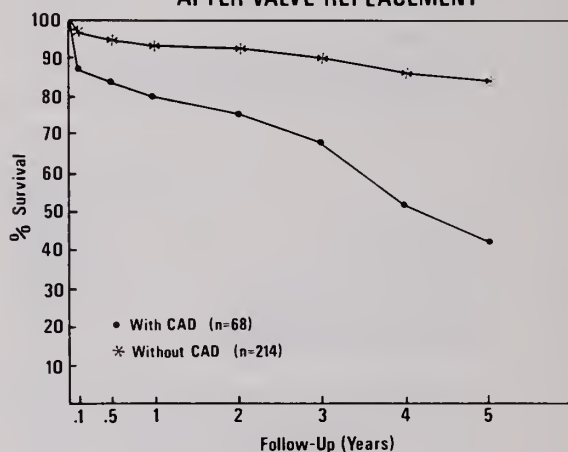


Figure 2 — Percent survival after valve replacement in patients with and without coronary artery disease.

Table 4
Survival after Valve Replacement

Patient Groups	No. Patients	Survival					
		1 Month	1 Yr	3 Yr	5 Yr	7 Yr	10 Yr
All Patients	282	.94 (.06)	.90	.85	.76	.71	.64
Aortic valve	134	.96 (.04)	.91	.86	.79	.77	.77
Mitral valve	108	.94 (.06)	.90	.84	.75	.66	.54
Double valve	40	.88 (.12)	.85	.82	.68	.68	.58
No Coronary Disease	214	.97 (.03)	.94	.89	.84	.81	.73
With Coronary Disease (CAD)	68	.87 (.13)	.80	.68	.42	.27	.27
Age Under 70 Years	234	.95 (.05)	.92	.89	.80	.74	.67
Age Over 70 Years	48	.92 (.08)	.77	.66	.53	.53	*
Age Under 70 Yr., No CAD	185	.97 (.03)	.95	.93	.87	.83	.74
Age Under 70 Yr., with CAD	49	.88 (.12)	.83	.73	.49	.30	*
Age Over 70 Yr., No CAD	29	.97 (.03)	.81	.72	.67	.67	*
Age Over 70 Yr., with CAD	19	.84 (.16)	.71	.55	.21	.21	*

*Numbers to 10 years too small to calculate valid survival

were operated as emergencies for acute dissection of the ascending aorta. There were no operative deaths in these 6 patients.

There were no operative deaths in the last 62 patients with aortic valve replacement, including 16 patients with coronary artery disease.

Late Survival

Percent survival for all patients and different subsets are listed in Table 4. Five year survival for all patients, subsets of valve types, and subsets over and under age 70 with and without CAD are displayed in Figures 1 to 3. Survival calculations include operative mortality.

Survival for all 282 patients was 76% at 5 years and 64% at 10 years. Five year survival for aortic, mitral and double valve replacement was 79%, 75% and 68% respectively.

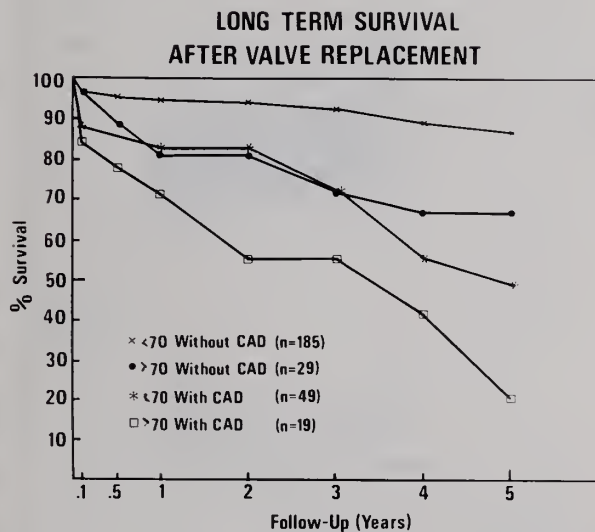


Figure 3 — Percent survival after valve replacement in subsets of patients over and under age 70 with and without coronary artery disease.

Five year survival for patients without coronary artery disease was double that of patients with CAD (84% vs 42%). Five year survival for patients over 70 years without CAD was 18% better than for patients under 70 years with CAD (67% vs 49%), much closer to the 76% survival for the entire 282 patients. Thus, age as an independent variable was less of a factor in late survival than the presence of CAD.

The causes of the 43 late deaths are listed in Table 5. The most common cause of late death was myocardial failure (19 of 43 patients) and 13 of these patients had CAD. Two additional patients died of acute myocardial infarction. Three patients died of bacterial endocarditis, 2, 13 and 51 months after surgery.

Thrombo-Embolic and Bleeding Complications

The types and incidence of thrombo-embolic and bleeding complications are shown in Table 6. The frequency of thrombo-embolic events was highest in the first two years after surgery: 3.6 and 3.0 per 100 patient years. Thrombo-embolic events averaged less than 1.5 per 100 patient years in the 4th through 10th years after surgery.

Five of the thrombo-embolic events occurred in patients who did not follow anticoagulation instruc-

Table 5
Late Deaths after Valve Replacement

	Aortic	Mitral	Double	Totals
Heart Failure	6	10	3	19
Acute Myocardial Infarction	2	-	-	2
Cerebrovascular Accident	2	2	1	5
Bacterial Endocarditis	3	-	-	3
Prosthesis Dysfunction	2	-	-	2
Miscellaneous (non-cardiac)	-	6	1	7
Unknown	-	2	3	5
Totals	15	20	8	43

Table 6

Late Thrombo-Embolic and Bleeding Complications after Valve Replacement

Years After Surgery Pt-Yrs of Follow-Up	1 249	2 200	3 164	4-6 242	7-10 76	Totals 931
Thrombo-Embolic Complications						
Aortic		2		1		3
Cerebral Tia	2	2	1	1		6
Double				1		1
Stroke	1*		1*		1	3
Double		1*				1
Other T-E	4**					4
Aortic		1				1
Double	1					1
Totals	9	6	2	3	1	21
T-E Events/100 Pt-Yr	3.6	3.0	1.2	1.2	1.3	2.3
Bleeding Complications						
Major Bleed/100 Pt-Yr	0	1.5	1.8	1.7	0	1.1

Thrombo-embolic or bleeding complications causing or associated with death (= 1 death) Major bleeding events: subarachnoid hemorrhage = 3; subdural hematoma = 4; other misc. = 4

tions carefully. Four of these patients had transient cerebral ischemic attacks and had sub-therapeutic prothrombin times at the time of symptoms. Subsequently, there was adequate anticoagulation control and there were no more reported symptoms of cerebral ischemia. The other patient stopped Coumadin against advice and later died of a cerebrovascular accident. A total of four patients died of cerebrovascular accidents which may have been embolic although this was not proven.

One patient had anticoagulant therapy stopped because of severe recurrent epistaxis and died of a thrombosed prosthetic aortic valve. This was the only patient known to have died of prosthetic valve thrombosis. One patient developed a new aortic regurgitation murmur with muffled prosthetic valve sounds two months after aortic valve replacement and was found to have partial thrombosis of the valve at re-operation, and has subsequently had no further problems. Another patient had an aortic regurgitation murmur from the first week after surgery and persistent cardiomegaly. Six weeks after surgery he had a splenic infarction and hematuria, the murmur disappeared and the heart size became significantly smaller within a month.

The incidence of thrombo-embolic complications occurring with the Starr-Edwards prosthesis was 2.4 per 100 patient-years, and for the Bjork-Shiley prosthesis was 2.0 per 100 patient-years. However, in the first three years after surgery, the incidence was 4.7 percent per year for Starr-Edwards valves and 2.1 percent per year in Bjork-Shiley valves.

No serious bleeding complications occurred in the first year after surgery. The incidence of serious bleeding complications was 1.1 per 100 patient years for the entire 931 patient years of follow-up. Unlike thrombo-embolic complications, the incidence of serious hemorrhagic complications was quite evenly distributed over the 9 years of the follow-up study.

Three patients had proven subarachnoid hemorrhage and two died of this complication. Two of these patients had connective tissue disorders (one with Marfan's syndrome) and another of the patients had a proven cerebral artery aneurysm. Two other patients died of major hemorrhage, although one of the patients also had disseminated carcinoma of the prostate discovered at autopsy.

Cardio-Thoracic Ratios

Figure 4 shows pre-operative and post-operative cardio-thoracic ratios of patients with aortic and mitral-double valve replacements. The mean decrease in cardio-thoracic ratios is significant at the .001 level

of significance. A significant decrease in heart size after valve replacement is a simple objective indicator of hemodynamic improvement.

The pre-operative CT ratio has some predictive value for long term survival. The larger the CT ratio, the more likely myocardial failure may adversely affect survival. Calculated five year survival for patients with CT ratios below the mean was 15% greater than for patients with CT ratios above the mean.

The failure of heart size to decrease significantly after surgery, especially if there is significant pre-

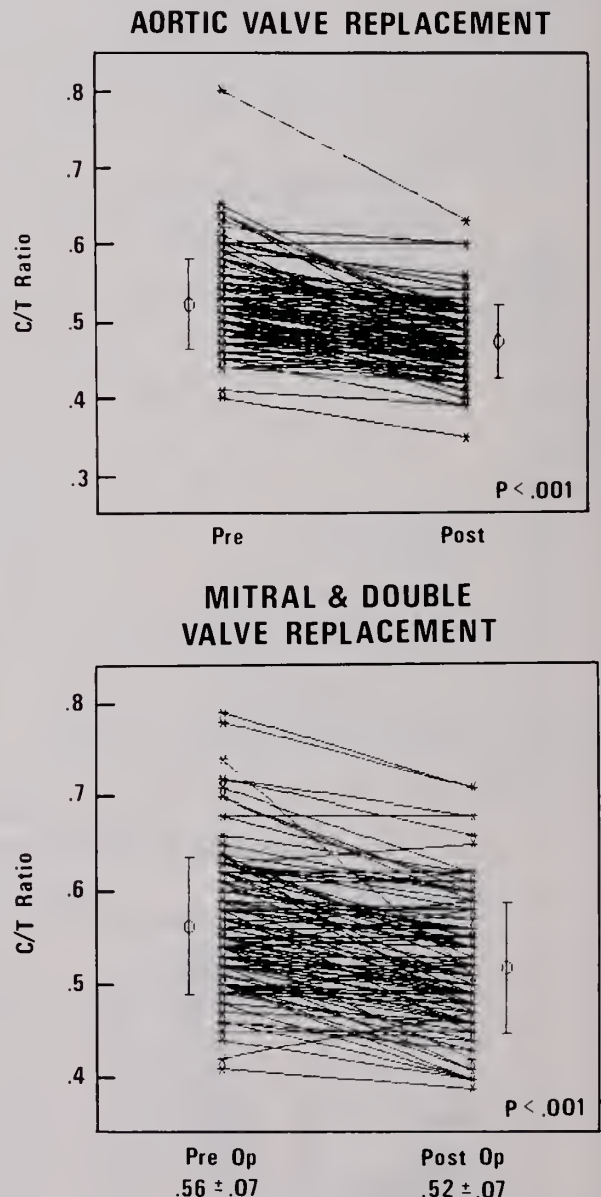


Figure 4 — Pre-op and post-op cardio-thoracic ratios in patients with aortic valve replacement (A-top), and mitral or double valve replacement (B-bottom).

operative cardiomegaly, also indicates probable myocardial failure or prosthesis dysfunction.³ In patients with pre-operative CT ratios over .55 (mean of 0.62) who had three or more years follow-up, patients who were alive had an average decrease in CT ratio of .08 but patients who had late deaths had an average decrease in CT ratio of .04.

Discussion

The goal of valve replacement surgery is to relieve cardiac symptoms and prolong life. Most patients experience significant improvement in symptoms of dyspnea, fatigue and chest pain. Evidence of increased longevity requires comparison of operated patients with the natural history of medically treated patients in the same functional class and similar hemodynamic abnormalities.

Average life expectancy (50% survival) in groups of patients with aortic stenosis after the onset of heart failure is about two years.^{4,5,6} Average survival after the onset of significant symptoms in patients with aortic regurgitation is two to three years.^{7,8} Patients with rheumatic mitral stenosis or insufficiency have better survival after the onset of symptoms, but about 50% of patients are dead in five years.^{9,10,11}

The natural history of patients with valvular insufficiency due to connective tissue abnormalities is less well defined. Patients with mitral valve prolapse may gradually develop marked mitral regurgitation, but may also suddenly develop severe mitral insufficiency due to rupture of chordae tendinae.^{10,11} Patients with mild aortic regurgitation and a root aneurysm due to cystic medial disease of the aorta may suddenly develop a dissecting hematoma of the aorta.

In this study, the 84% five year survival in patients with significant valve dysfunction is consistent with

the view that properly timed valve replacement results in significant improvement in survival.^{10,11} However, the 46% five year survival in patients with both significant valve dysfunction and coronary artery disease indicates that this is a serious combination and the presence of coronary artery disease has a major adverse effect on survival. This is especially true if mitral valve insufficiency is related to a left ventricular aneurysm or papillary muscle dysfunction from a previous myocardial infarction.^{12,13} Coronary artery bypass of significantly obstructed coronary arteries at the time of valve replacement is generally recommended.^{14,15} However, Bonow, et al. have not bypassed obstructed coronary arteries (except left main obstruction) in patients with combined aortic valve and coronary artery disease and question the efficacy of myocardial revascularization in these patients.¹⁶

Chronic pressure or volume overload of the ventricles may lead to varying degrees of irreversible myocardial dysfunction.^{17,18,19} In general, the larger the cardiac dimensions and the lower the left ventricular ejection fraction, the more likely some permanent impairment of myocardial function will be present.^{11,19,20} Treating patients with valvular dysfunction until they are severely incapacitated before considering surgery will increase the likelihood of irreversible myocardial failure and decrease the chance of optimum improvement after surgery.²²

Figure 5 shows pre- and post-operative roentgenograms of a 67 year old man with mitral valve disease that progressed far beyond the optimal time for mitral valve replacement. There was initially improvement after surgery with a decrease in cardio-thoracic ratio from 0.79 to 0.72. However, 2½ years after surgery,

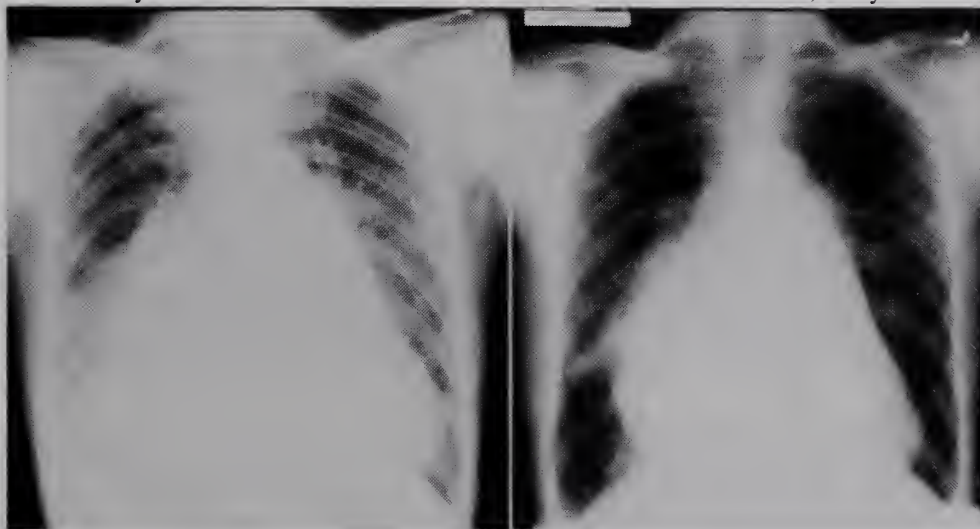


Figure 5 — Pre-operative and 7 month post-operative chest roentgenograms on a patient with marked cardiomegaly from chronic rheumatic mitral stenosis and insufficiency.

heart failure again became a difficult to manage problem and the patient died of myocardial failure 3½ years after surgery.

Most patients who are functional class 3 (New York Heart Association Classification), or who have a cardio-thoracic ratio over 0.55 should be evaluated for valve replacement. Syncope and angina pectoris, especially in patients with aortic valve disease, should also lead to consideration of valve replacement. Repeated cardiac catheterization studies are not necessary to determine whether continued medical management or valve replacement is indicated. Optimum timing of valve replacement can usually be determined by clinical evaluation and non-invasive tests such as echocardiography and radionuclide cardiac studies.²² If surgery is indicated, an invasive study may be needed to exclude unsuspected pathology and define the coronary artery anatomy.

Cardiac valve replacement when the patient is minimally symptomatic or has evidence of only mild cardiac dysfunction could be routinely considered if there were no surgical risks and a perfect prosthetic cardiac valve was available. Mechanical prosthetic valves have the most proven durability but require anticoagulation to minimize the risk of thrombo-embolic complications.²³ Bio-prostheses have a lower

incidence of thrombo-embolic complications but do not have as well established long-term durability. Our approach has been to use bio-prostheses mostly in elderly and other selected patients where there is a greater risk of serious bleeding complications with chronic anticoagulation therapy. The rate of thrombo-embolism in our patients is comparable to that reported in other studies using comparable prosthetic valves.^{24,25,26} Recent randomized studies indicate that the combination of Coumadin and Dipyridamole is more effective than Coumadin alone in preventing thrombo-embolic complications.²⁴

In this series of patients, thrombo-embolic complications or endocarditis were considered to have likely caused death in 11 patients. This is an incidence of about one percent per year and theoretically could be reduced. While the incidence of these fatal complications seems relatively low, it adds up to 5% in 5 years and therefore, represents about 25% of the late deaths in this series. If more persistent and repeated emphasis by the patient's primary physician and cardiologist about the importance of antibiotic prophylaxis and careful anticoagulation control could cut this late mortality in half, it would be well worth the effort.

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For assistance with scheduling meetings, please contact the MMA office (address and phone given below) for information on future medical meetings and CME courses at the state and national level.

Information for each entry is arranged as follows: Date: Name of program: Primary sponsor: Location: Contact person.

December, 1983

1-2 Critical Pediatrics; St. Louis Park Medical Center Research Foundation; Bloomington Marriott; CONTACT: Elaine Anderson, Assistant Director of Medical Education, 5000 West 39th Street, Minneapolis, MN 55416; 612/927-3703.

2 Neonatal Resuscitation; North Memorial Medical Center; NMMC; CONTACT: Martin Weems, M.D., 3300 Oakdale North, Robbinsdale, MN 55422; 612/520-5200.

3 Frontiers in Medicine; St. Joseph's Hospital, St. Paul-Ramsey Medical Center & U of M Medical School; St. Joseph's Hospital; CONTACT: Charles Drage, M.D., 69 West Exchange, St. Paul, MN 55102; 612/291-3180.

7-10 Coronary Heart Disease; A Comprehensive Review of Principles and Practice; St. Paul-Ramsey Medical Center & U of M Medical School; Sheraton Midway Hotel; CONTACT: Ruth McIntyre, 640 Jackson Street, St. Paul, MN 55101; 612/221-3992.

January, 1984

7-11 Clinical Electrodiagnosis; Mayo Clinic/Mayo Foundation; Mayo Clinic, Rochester; CONTACT: William L. Nietz, Mayo Clinic, 200 First Street S.W., Rochester, MN 55905; 507/284-2085.

18-20 Telmark Cancer Conference; The Duluth Clinic, Ltd. & Marshfield Clinic; Telemark Lodge; CONTACT: James G. Brueggemann, M.D., The Duluth Clinic, Ltd., 400 East 3rd Street, Duluth, MN 55805; 218/722-8364.

27-28 New Drugs; St. Louis Park Medical Center Research Foundation; Sheraton Park Place Hotel; CONTACT: Elaine Anderson, Assistant Director of Medical Education, 5000 West 39th Street, Minneapolis, MN 55416; 612/927-3703.

February, 1984

3 Surgical Care of Skin Cancer; MN Dermatological Society; Hennepin County Medical Center; CONTACT: J. D. Vance, M.D., 701 Park Avenue S., Minneapolis, MN 55415; 612/347-2332.

4-21 1984 Winter Sportsmedicine Conference; North Central Medical Conference; Sarajevo/Dubrovnik, Yugoslavia; CONTACT: Harold Brunn, North Central Medical Conference, 2221 University Avenue S.E., Suite 400, Minneapolis, MN 55414; 612/378-1875.

8-9 Drug Therapy Symposium; University of Minnesota; Radisson, St. Paul; CONTACT: CME, U of M, Box 293 Mayo Memorial Building, 420 Delaware Street, S.E., Minneapolis, MN 55455; 612/373-8012.

8-10 Training Workshop in Pulmonary Function Testing; St. Paul-Ramsey Medical Center, St. Paul-Ramsey Medical Center; CONTACT: Ruth McIntyre, 640 Jackson Street, St. Paul, MN 55101; 612/221-3992.

15-18 Recent Advances in Coronary Artery Disease; Mayo Clinic/Mayo Foundation; Maui Marriott Resort, Maui, Hawaii; CONTACT: William L. Nietz, Mayo Clinic, 200 First Street, S.W., Rochester, MN 55905; 507/284-2085.

16-17 Current Concepts in Perinatal Medicine; St. Paul-Ramsey Medical Center & U of M Medical School; Radisson Plaza Hotel; CONTACT: Ruth McIntyre, 640 Jackson Street, St. Paul, MN 55101; 612/221-3992.

24-25 ENT Problems in Primary Care; University of Minnesota Medical School; Sheraton Ritz Hotel, Minneapolis; CONTACT: Bart W. Galle, Ph.D., Interim Director, U of M CME, Box 293, Mayo Memorial Building, 420 Delaware Street S.E., Minneapolis, MN 55455; 612/373-8012.

March, 1984

2-3 Family Practice Update; St. Joseph's Hospital; St. Joseph's Hospital; CONTACT: Charles Drage, M.D., 69 West Exchange, St. Paul, MN 55102; 612/291-3180.

3-10 St. John's Hospital Winter Seminar, "Current Concepts of Medicine"; Ramsey County Chapter of the MN Academy of Family Physicians & St. John's Hospital; Vail Village Inn, Vail, Colorado; CONTACT: Mrs. R. J. Sells, 2040 E. Kenwood Drive, St. Paul, MN 55117; 612/776-2110.

8-10 Current Concepts in Cardiopulmonary Medicine; St. Paul-Ramsey Medical Center & U of M Medical School; Radisson Plaza Hotel; CONTACT: Ruth McIntyre, 640 Jackson Street, St. Paul, MN 55101; 612/221-3992.

9-10 Colon and Rectal Diseases; U of M Medical School; Hyatt Regency Hotel; CONTACT: CME, University of Minnesota, Box 293 Mayo Memorial Building, 420 Delaware Street, S.E., Minneapolis, MN; 612/373-8012.

10 Occupational and Environmental Pulmonary Diseases; St. Paul-Ramsey Medical Center & Midwest Center for Occupational Health & Safety & University of Minnesota Medical School; Radisson Plaza, St. Paul; CONTACT: Ruth McIntyre, 640 Jackson Street, St. Paul, MN 55101; 612/221-3992.

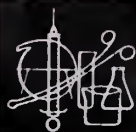
23-24 Obstetrics Update; St. Paul-Ramsey Medical Center & U of M Medical School, The Saint Paul Hotel; CONTACT: Ruth McIntyre, 640 Jackson Street, St. Paul, MN 55101; 612/221-3992.

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Interspecialty Council Highlights

October, 1983

DRGs

The following are questions and answers from the second of three planned discussions on DRGs.

Q: What is happening in the cost containment-risk management area, in relation to quality of care, with DRGs?

A: Most hospitals have not thought this far in advance. It's reasonable to assume that malpractice suits will increase as a result of the DRG system. No one has begun to put into place risk management programs which are specifically geared to the new system.

Q: Is there a provision for the patient to sue the federal government?

A: This is a question asked often, but at this time it wouldn't appear to work that way. It would take a court test to prove its viability.

Q: How is the formula being calculated for the variety of degrees in teaching hospitals relative to the allowances in the direct costs?

A: The specifics are found in the federal register but the formula is based on the number of residents in a hospital program.

Q: What has been the experience at reducing cost?

A: New Jersey's system is somewhat different than the experience we will have because New Jersey rolled into the system an allowance for indigent care (a subsidy) for inner city hospitals. Because of the differences in the system it is somewhat difficult to compare what they had with what we will have. The New Jersey program is an experimental program which has not been evaluated adequately prior to full-scale national implementation.

Q: Is there any provision for adjusting historical rates to current prices for goods and services?

A: There is a provision for an annual adjustment in the rates and a reassessment of the structure of the system every 4 years. However, the readjustment will be minimal. The whole purpose of the prospective payment system is to maintain and salvage a system that is losing money dramatically . . . the medicare system. It will be important for physicians to work with the policy makers to secure changes in the system which will acknowledge increasing technology. Flexibility in the system will be needed to allow for new technology, new procedures and new systems which are not now currently part of the framework.

Q: Do they only pay for the diagnosis that is the longest, not the 2 or 3 complications that may have arisen?

A: They pay on the *principal diagnosis*, not on the diagnosis which is "longest" or most resource intensive. The principal diagnosis is that diagnosis which *after study* is found to be the *primary reason* for the patient's admission to the hospital. A complication may change the DRG number by raising it to a higher number. There are 467 DRGs with 3 exceptions. The 468th DRG is for "everything else" which could accommodate the very complicated and costly diagnosis and procedures. The record keeping staff will have the computer program to determine the correct DRG based on the diagnosis, procedure and any complications and comorbid conditions determined by the physician. The physician will not be responsible for assigning the DRGs. There are several flaws in the system which would allow hospitals to benefit or at the very least balance their deficits. An unfortunate part of the system is the incentive to admit patients while the doctors have

INTERSPECIALTY HIGHLIGHTS

been advocating outpatient assistance for cost containment. The incentives seem to be backwards and are very much a cause for concern.

Q: What are the guidelines regarding the legal-moral issue of a patient who suffers, for example, a myocardial arrest which results in a constant vegetative state?

A: The patient will become an outlier, the hospital will be paid for the diagnosis appropriate and on an outlier basis. This is based on 60% of the perday cost — (based on the average number of days for the DRG divided into the total amount paid for that DRG) times 60%. For each additional day the hospital will receive 60% of what the Feds have determined it costs to provide the care.

UCR vs Indemnity

Present AMA policy supports freedom of patients to choose their source of care and freedom of physicians to choose their method of payment — including fee-for-service, capitation, or salary.

Within the fee-for-service approach, current AMA policy supports the basing of third party payment levels on the “usual and customary or reasonable” concept, and the majority of private and public payors use the “UCR” concept in establishing payment levels. However, the increasing costs *resulting from this approach have caused both private and public payors to be caught between mounting pressure to constrain plan outlays on the one hand, and continuing consumer demand for comprehensive coverage of physicians’ services on the other.*

As one result, the “reasonable charge” used by payors — particularly public payors — in determining payment levels *no longer reflects the actual charges made by most physicians*, because of infrequent updating of fee profiles, percentile cut-offs on customary charge data, and annual percentage caps on prevailing charge increases.

In addition, pressure is increasing on physicians to accept the payor-determined reasonable charge as payment in full (except for allowed deductibles or coinsurance) — i.e., to become “participating physicians.” Such pressure is exerted through:

- Plan or company contracts which increasingly allow assignment of benefits or make payment only when services are provided by participating physician;
- beneficiary misunderstanding of “explanation of benefit” letters and resulting patient/physician friction;
- “hold harmless” communications from payors to subscribers, and
- increased consideration nationally of mandatory assignment or fee schedules under Medicare.

As these trends continue, patients will be increasingly restricted to “participating” providers as a condition for insurance coverage. *Eventually, physicians’ remuneration will be determined solely by third party payors for the great majority, if not all, of the professional services they render — which will be a resulting inevitable mediocrity in the quality of medical care.*

Accordingly, the Council on Medical Services believes that *the Association should seriously consider recommending that third parties change to an indemnity system of payment for physician’ services*, i.e., paying a set amount for services rather than some proportion of the “usual and customary or reasonable” charge. Such a set amount would be determined by the payor itself on the basis of claims experience, public demand, competition and other relevant factors.

Such a change would benefit patients by:

- Insuring their continued access to care *not through external regulation of fees but through market forces*;
- increasing both physicians’ and patients’ sensitivity to costs and quality of care provided;

INTERSPECIALTY HIGHLIGHTS

- allowing them continued freedom of choice rather than being increasingly restricted to "participating" providers as a condition of coverage, and
- facilitating understanding and comparison of insurance coverages.

For third parties, *rate determination would be simpler under an indemnity approach.* Payors could establish premiums on the basis of prospective analysis of what the plan pays rather than on a statistical array of physician charges. Administrative costs should be significantly less. *For government programs especially it provides an alternative which permits budgetary restraints without further restrictions on type or duration of services covered or massive increases in enrollee copayment.*

For physicians this approach could bring improved patient-physician interaction, since neither physician nor payment will have false expectations of the amount of third party payment. *Uncoupling third party payment from physicians' charges could act to reduce legislative and political pressure for mandating physician "participation" as a condition of payment, and help preserve for physicians the freedom to charge what they believe to be a fair and equitable fee, subject only to normal and effective market constraints.*

Cover Photo

"Season's Greetings"

Dr. Claus Pierach, author of this month's cover, is an Associate Professor of Medicine of the University of Minnesota Teaching Unit at Abbott-Northwestern Hospitals, Minneapolis.

The poinsettia was a Christmas gift from his son who had purchased the plant at the reduced price of \$1.99. The day after Christmas the family being snowbound due to a large storm which hit the Cities, Dr. Pierach decided to paint the poinsettia in oil. He claims to be an amateur; a fact not accepted by the Editors, as he certainly has vividly caught the poinsettia with his brushes.

This is the third MINNESOTA MEDICINE cover by Dr. Pierach; the other two being January, 1978, and October, 1979.

Harold A. Diehl Award

The committee for the Diehl Award given annually by the Minnesota Medical Alumni Association solicits nominations for this award from the physicians of Minnesota. The award is presented to one or more physicians meeting these four major criteria:

1. Preferably an alumnus of the University of Minnesota Medical School.
2. Not engaged in an academic capacity.
3. Has made outstanding contributions to the Medical School, the University, the Alumni, and the community.
4. Has had a relatively long experience in the field of medical science or a related field.

Nominations for the 1982 awards should be sent immediately to:

Konald A. Prem, M.D., Chairman,
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Detailed supporting documents are necessary to consider nominees, but these can be forwarded later.

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IMMEDIATE OPENING for primary care physician. Either Family Practice or Internal Medicine. Midway area of Saint Paul. Contact David Klevan, M.D. at 612-645-0711. 451 North Dunlap, Saint Paul, MN 55104.

INTERNIST-NEPHROLOGIST-INTERNIST-GASTROENTEROLOGIST-INTERNIST-GENERALIST — Sought for multispecialty group practice in Northern Minnesota. New 175 bed hospital with dialysis unit, full diagnostic services and support facilities. Nationally acclaimed school system and broad range of recreational facilities. Excellent opportunity for aggressive internist. Liberal compensation system. Excellent fringes. Send curriculum vitae to: R. Dinter, M.D., Mesaba Clinic, 1814 14th Avenue East, Hibbing, MN 55746.

GENERAL SURGEON AND/OR OB/GYN SURGEON to join 10 doctor multi-specialty group in Owatonna, a community of 18,500 located 68 miles south of the Twin Cities and 42 west of Rochester. Present staff consists of 7 family practitioners, 2 internists, and 1 general surgeon. Other specialties in the community and a close working relationship with the Mayo Clinic, the University of Minnesota hospitals, and other metropolitan centers provide for excellent consultations. Guaranteed salary first year with incentive program thereafter. Group Health, disability, life and accident insurance, retirement profit sharing, and automobiles provided by corporation. Contact: J. D. Miller, M.D. or James Wilkus, Administrator, Owatonna Clinic, P.A., 134 Southview, Owatonna, MN 55060. Telephone (507) 451-1120.

WANTED: Ob-Gyn, family practitioner, pediatrician and internal medicine to join multi-specialty group. One month vacation, hunting, fishing and lake recreation area. Starting salary excellent, many fringe benefits included. Write: MINNESOTA MEDICINE (735), 2221 University Ave. SE, Suite 400, Minneapolis 55414.

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GENERAL SURGEON AND INTERNIST to join 8 family physicians and 2 internists. Recently remodeled and expanded clinic facility, 6 blocks from modern well-equipped 99 bed hospital, 45 minutes south of Minneapolis on 35W. First year salary guarantee, paid malpractice, life and disability insurance, vacation and study time.

Contact Darral Mischke, Clinic Administrator, Faribault Clinic Ltd. 924 N.E. 1st Street Faribault, MN. 55021.

ORTHOPEDIC SURGERY — LA CROSSE, WISCONSIN 50-physician multispecialty group seeking qualified orthopedic surgeon to join busy 2-physician department. 350-bed hospital, adjacent to clinic, includes comprehensive radiology service, full joint replacement systems, recently expanded Physical Therapy Department, and 24-hour E.R. staffing. Clinic offers attractive compensation including first year guarantee and incentive plus substantial fringe benefits. La Crosse is a progressive city of 50,000 in the beautiful Mississippi River Valley. Patient drawing area is approximately 175,000. Exceptional cultural, educational and recreational opportunities locally. Contact P. S. Shultz, M.D., Medical Director, Skemp-Grandview-La Crosse Clinic, 815 S. 10th St., La Crosse, WI 54601. Phone (608) 782-9760.

INTERNIST, BOARD Certified or eligible, needed to join eleven physician clinic in Alexandria, Minnesota. Associated with well-equipped hospital. Subspecialty interests welcome, but need firm background in general internal medicine. Excellent benefits, starting salary \$50,000.00. For more information contact David Hellstern, Administrator, Alexandria Clinic P.A., 610 Fillmore Street, Alexandria, MN 56308 or call collect (612) 763-5123.

STAFF PSYCHIATRIST CMHC has an excellent opportunity for a staff psychiatrist. Must be board eligible. Programs include in-patient, out-patient, education and consultation, specialized services to children, the chronically mentally ill, and the chemically dependent delivered in conjunction with a seasoned team of multi-disciplinary mental health professionals including two part-time psychiatrists. Excellent four-season recreational area. Salary and fringe benefits negotiable. Contact: Donald E. Frees, ACSW, Area Program Director, P.O. Box 646, Bemidji, MN 56601. An Equal Opportunity Employer.

FAMILY PRACTITIONER position available with Mankato Clinic Ltd. Our 30 man multi-specialty group attracts specialty referrals from a southern Minnesota area of 200,000 population. Excellent group practice opportunity in All-American community with full hospital services; full range of group fringe benefits, liberal time off, salary first year; incentive pay thereafter. For more information call collect R.F. Roskens, Administrator or Dr. B.C. McGregory 507-625-1811.

HOW TO KEEP KIDS HAPPY — PlayscapeTM centers. Rugged, compact, colorful, two-level children's activity structure for your waiting room. A marketing idea already proven by over 60,000 happy little Wisconsin patients. Educational, imagination-stretcher play stations. Irresistible crawl spaces. No loose toy clutter . . . just lots of fun. Your pediatric patients relax and come to your examining room in a cooperative frame of mind. Space savers. Staff pleasers. European "knock-down" connectors make assembly simple with no schedule interruptions. Call or write for a free color brochure today. PLAYSAPES, Children's Environments 902 Spaight Street, Madison, WI 53703. (608) 251-0238.

FOR RENT, \$1500 A MONTH, two bedroom oceanfront cottage with panoramic view of Atlantic overlooking site where PT 109, the World War II saga of President John Kennedy, was filmed. Exquisite fishing, excellent snorkeling, absolute rest, unmatched privacy, and gorgeously warm weather. Rent include utilities. Furnished. 26 miles from Key West, 25 miles from Marathon. Call 1-612-920-7818 after 6 PM. Prefer monthly rentals.

INTERNIST, board certified/board eligible to join a soon to be vacated solo practice in Northfield, Minnesota. For an internist wishing to join a multi-specialty group and absorbing the current solo practice, this is also an option. Broad array diagnostic and clinical services provided locally and through specialties from the Twin Cities. Practice is established, stable, and with considerable potential. Two college community, excellent quality of life, short distance from Mayo Clinic as well. Call and send vitae to: Cliff Christiansen, Northfield City Hospital, 800 West Second Street, Northfield, Minnesota 55057 (Phone: 507-645-6661).

Classified Advertisements

1984 CME CRUISE/CONFERENCES ON LEGAL-MEDICAL ISSUES — Caribbean, Mexican, Hawaiian, Alaskan, Mediterranean. 7-14 days in Winter, Spring, Summer. Approved for 18-24 CME Cat. 1 credits (AMA/PRA). Distinguished professors. FLY ROUNDTRIP FREE ON CARIBBEAN, MEXICAN, & ALASKAN CRUISES. Excellent group fares on finest ships. Registration limited. Pre-scheduled in compliance with present IRS requirements. Information: International Conferences, 189 Lodge Ave., Huntington Station, N.Y. 11746. (516) 549-0869.

FAMILY PHYSICIAN, board eligible, to join group of six Board Certified Family Practitioners and one Board Certified General Surgeon in Blue Earth, Minnesota. \$45,000.00 plus incentive bonus first year with full membership after first year. 4,000 population with practice area of 25,000 in South Central Minnesota. Economy is stable agricultural plus small clean industries. Connected hospital and clinic enlargements now under construction. Complete ancillary support including anesthesiology, radiology, pathology, etc. Contact Marjeane Werner, Clinic Administrator or Dr. Thomas E. Watts, Business Phone: (507) 625-7371. Blue Earth Medical Center, Ltd., 520 South Galbraith, Blue Earth, MN 56013.

OB GYN to join successful 12 physician practice in Faribault, MN, just 50 miles south of Mpls. on 35 W. 2 general surgeons, 2 internists, 8 family physicians. Busy OB practice. Newly remodeled clinic 5 blocks from modern well-equipped hospital. Guaranteed salary first year, incentive compensation thereafter. Disability, Life, Health, Malpractice insurance paid by the clinic. Profit sharing and pension plan as well as generous vacation and study time. Contact Darral Mischke, Administrator, Faribault Clinic, Ltd., 924 N.E. 1st St., Faribault, MN 55021. Telephone: 507-334-3921.

DERMATOLOGIST, Board certified/eligible to join progressive multi-specialty group of 40+ physicians. Pleasant growing community. Many outdoor recreational opportunities. High quality of life. Referral area, 150,000. Liberal financial benefits. Send curriculum vitae and references, ATTN: M. T. Anderson, M.D., 101 Willmar Avenue, Willmar, MN 56201.

FAMILY PRACTICE OPPORTUNITY: Three man family practice clinic in Central Minnesota looking for additional family practitioner. Clinic attached to 124 bed excellent hospital. Package consists of annual salary with incentives, relocation expenses, disability, health and malpractice insurance, vacation and an early partnership. For information please call O. E. Wiger, M.D., Family Clinic P.A., 808 S.E. 3rd St., Little Falls, MN 56345. Tel 612-632-2301 office, or 612-632-9325 home.

PSYCHIATRIST to join progressive multi-specialty group of 40+ physicians. Pleasant, growing community. Many outdoor recreational opportunities. High quality of life. Referral area: 150,000. Liberal financial benefits. Send curriculum vitae and references to ATTN. H.P. Hinderaker, M.D., 101 Willmar Avenue, Willmar, MN 56201.

FAMILY PHYSICIAN FOR PROGRESSIVE RURAL MINNESOTA CLINIC. New and superbly-equipped facility. A pleasant farming community in a physician shortage area, yet only 25 minutes from a metro area. A comfortable call schedule at nearby hospital. Gateway to Minnesota's famous lake country. Young and growing practice with excellent salary and benefits, ownership potential. Must be board-eligible. Call or write to Mr. Ralph Solhjem or Faris Keeling, M.D. at 218-354-2111 or write to Barnesville Area Clinic, P.O. Box 521, Barnesville, MN 56514.

FAMILY PHYSICIAN needed to join a Multispecialty Group in a growing area of Minnesota. The Group is young and progressive and provides a great opportunity to a Board-Certified Family Practitioner. A large hospital utilized for the hospitalization of patients with back up of specialists. The call schedule will allow you the opportunity to enjoy the cultural and recreational activities which are abundant in this area of Minnesota. Salary and fringe benefits are open and negotiable. If interested, please send your curriculum vitae to Minnesota Medicine (736), 2221 University Avenue SE, #400, Minneapolis 55414.

FAMILY PRACTITIONER — Join an active practice in Northern Minnesota. Two young F.P.'s are looking for one or two associates to replace retiring partner. Attractive clinic and 44 bed hospital in a friendly town of 2000. Contact W. Ofstedal, M.D., 218-435-1212, Fosston, Minnesota 56542.

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NEEDED IMMEDIATELY. physicians for General Practice, Internal Medicine specialists and pediatrician for growing Southern Minnesota medical group. Three young physicians with good supporting staff in various specialties need full time specialists and family physicians to meet growing need. Large brand new clinic and attached hospital with expansion plans in progress. Salary or independent practice available with optional buy in, liberal fringe benefits, very flexible call schedule and wide practice freedom. Please call — Tom Koehnen M.D. or Noel Collis M.D. at (507) 375-3391 or write St. James Area Family Clinic, 1205 6th Ave. South, St. James, MN 56081.

FAMILY PRACTICE. Outstanding opportunity for BE/BC F.P. with dynamic, young group practice. Located in exceptionally clean and safe city of 175,000; home of state capitol and university. Full fringes; salary commensurate with experience. Send inquiry and resume to: Dr. Kongstvedt, Health Central, 17th and "N", Lincoln, Nebraska 68508. Phone (402) 475-7000.

FAMILY PHYSICIAN: Board Certified, full-time position teaching residents and medical students at Hennepin County Medical Center (an equal opportunity employer. Applications from women and minorities are specifically invited.) Academic appointment — University of Minnesota Medical School. Inquiries to: Stuart V. Thorson, M.D., Department of Family Practice, Hennepin County Medical Center, 701 Park Avenue South, Minneapolis, MN 55415. (612) 347-3103. Applications will be accepted to January 1, 1984.

EMERGENCY PHYSICIANS or primary care specialists with E.R. experience: Full time practice opportunities available beginning January, 1984, In Minneapolis/St. Paul at our newest free-standing emergency centers. Admissions and referrals through a major Minneapolis teaching hospital. Excellent salary with opportunity to advance and join a physician partnership which develops, staffs and manages free-standing emergency centers and hospital E.D.'s nationally. Send CV to: Madeleine Shalowitz, M.D., The Flashner Medical Partnership, The Doctors Emergency Officenters, 830 E. Rand Road, Mt. Prospect, IL 60056.

LAND FOR SALE: 40, 80, 140 acre parcels in Carlton County. Road access, high land, wooded, \$200 to \$300 per acre. Write Charlie Gronquist, M.D., 1210 Wilson Avenue, Cloquet, MN 55720, or call at 218-879-4813.

PHYSICIAN DESIRES TWO (2) other Doctors to share large office, downtown Minneapolis. Approx. monthly rent, utilities, phone, etc. would be \$700-800. Call: 612-870-8448.

CONDOS FOR INVESTMENT — Outstanding tax favored investment? Excellent return on investment? Lots of leverage? Investment in the condominium boom is the sophisticated investor's answer. For just 10% down, buy one to four, 1 or 2 bedroom units at Bridgewalk. Price in the mid-fifties to the mid-seventies. Excellent suburban Minneapolis location (Highway 12 and 18). Outstanding amenities. Below market interest rates. Call 545-3085 today for details.

GENERAL SURGEON, Board certified or eligible, to join an eight doctor medical center. Located at International Falls, Minnesota. Outdoor paradise with Voyageurs National Park and Wilderness canoe area. Must be qualified to perform general surgery, including orthopedic and GYN procedures. Located 100 miles from Bemidji and 160 miles from Duluth. Known as the "Ice Box of the Nation" but only on weather maps. Contact Dr. George M. Crow or Dr. A. Marc Gorden, 218-283-9431.

IDEAL PRACTICE OPPORTUNITIES for an Orthopedic Surgeon, an Obstetrician/Gynecologist, a Pediatrician and a General Surgeon in a community of 17,000 just 40 miles south of Minneapolis/St. Paul. Modern, well-equipped 99 bed hospital serving a 30,000 population base. Physician survey confirms needs. Varied cultural, educational and recreational opportunities within short distance. Contact Physicians Search Committee, District One Hospital, 631 S.E. First Street, Faribault, Minnesota 55021 or call 1-507-334-6451.

ENJOY THE NORTHWOODS! Need an aggressive, hard-working Internal Medicine Specialist and a Family Practice Specialist to join a brand new clinic in Eagle River, Wisconsin. Great income potential and outstanding fringe benefit packages available. For further information call collect (715) 842-3202, or write to Administrator, 2409 N. 13th, Wausau, Wisconsin 54401.

MEDICAL DIRECTOR — Leading medical education facility has opening for medical director to develop curriculum for medical lab tech, medical assistant, dental assistant programs. Hire and train instructors in an AMA accredited institution. MD with pathology or general practice experience with demonstrated interests in education. Mpls. location. (612) 831-5232 Metropolitan Medical Placement.

FAMILY PRACTICE for sale in small southern Minnesota community — office, equipment, and practice — reasonable. Call evenings. 612-388-7584.

PRIMARY CARE PHYSICIAN — opportunity for internist or family practitioner in north suburban area. Contact Dr. Duane Orn, Northport Medical Center, 5415 Brooklyn Boulevard, Brooklyn Center, MN 55429. 612-533-8666.

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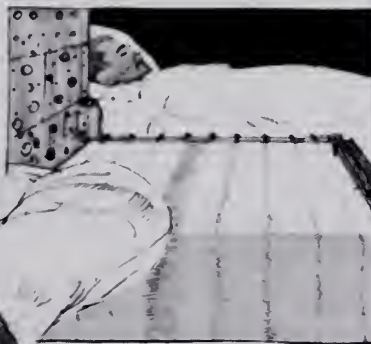


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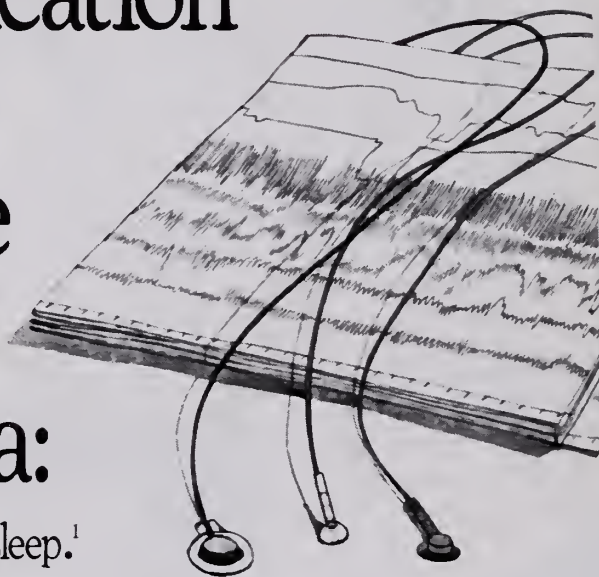
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